

Glossary on renewable energy and landscape quality: the glossary

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GLOSSARY ON RENEWABLE ENERGY AND LANDSCAPE QUALITY – THE GLOSSARY

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ENERGY LANDSCAPE

Definition

An energy landscape is characterized by one or more elements of the energy chain (e.g. energy extraction, assimilation, conversion, storage, transport or transmission of energy). The outcome can be a multi-layer energy landscape comprising combinations of technical and natural sources of energy within a landscape. In COST RELY, energy landscape is focused on renewable energy and the impact on landscape quality.

Related terms

Landscape resilience, Landscape sensitivity, Landscape vulnerability

Keywords

Energyscapes, Landscapes of carbon neutrality, Multi-layer, Multi-functional, Renewable energy sources, Sustainable energy landscape



Figure 3a. Three layers of energy production in the area of Garzweiler II, Germany. Foreground: agriculture with oil pumping. Middle: open brown coal mining with a coal-fired power plant. Background: wind turbines. (Photo: Alexandra Kruse 2016)



Figure 3b. Wind energy landscape, Ore Mountains, Czech Republic (Photo: Bohumil Frantal 2012)



Figure 3c. This energy landscape in Carinthian Mölltal in Austria shows different layers of energy production and impact on the landscape. Foreground: electric train line and electricity high voltage cables. Middle: agriculture including modern hay balls; background, forestry. These very intensive and close layers are dominating the Alpine valleys in Austria. (Photo: Alexandra Kruse 2016)

Source

Definition developed by COST RELY Action.

Translations	
Bosnia and Herzegovina: Energetski pejzaž/ Energetski krajolik	Italian: Paesaggio dell'energia
Bulgarian: Ландшафт за производство на енергия	Icelandic: Orkulandslag
Croatian: Energetski krajolik	Latvian: Enerģijas ainava
Czech: Energetická krajina	Lithuanian: Energijos gavybos kraštovaizdžiai
Danish: Energiandskab	Montenegrin: Energetski pejzaž
Dutch: Energie landschap	Polish: Krajobrazy energetyczne
Esperanto: Energia pejzaĝo	Portuguese: Paisagem de energia
Estonian: Energiamaastik	Romanian: Peisaj energetic
Finnish: Energiamaismat (not commonly used)	Russian: Энергетический пейзаж
French: Paysage énergétique	Slovakian: Energetická krajina
German: Energielandschaft	Slovenian: Energetska krajina
Greek: Ενερgetικό Τοπίο	Serbian: Енергетски пејзажи (земљишта)
Hebrew: נוף אנרגיה	Spanish: Paisajes de las energías/ Paisajes energéticos
Hungarian: Energiatáj (the term is not in use)	Swedish: Energi landskap

LANDSCAPE

Definition

- (1) An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.
- (2) An area (spatial component) as perceived by people (subjective component), whose sensually perceivable features (link to aesthetics in the original meaning of the Greek ‘aisthesis’) and character (Alexander von Humboldt's definition of landscape) are the result (evolutionary/temporal aspect of landscape) of the action of natural and/or cultural factors (holistic view of landscape).
- (3) The Swedish primary definition of the word landscape (*swe. landskap*) denotes the conditions in a country, a country's character, and/or a country's traditions. Originally, landskap was strongly related to customs, ideas of homeland, justice, nature, and nation (Olwig 1996). Landskap was a social space that denoted a territory and its people, and connoted aspects of custom, value, and everyday life.
- (4) For many people, landscape simply means scenery – everything that is around us and can be viewed at one time from one place on the horizon – or all the visible features of an area, considered for their aesthetic appeal.

Related terms

Landscape identity, Landscape quality, Landscape sensitivity, Landscape service, Landscape vulnerability

Keywords

/



Figure 4. Landscape – composed by houses, forest, bushes, windmills, single trees and meadows, Sao Miguel, Azores (Photo: Naja Marot, 2006)

Source

A discussion on the origin and meaning of the term landscape, including the three definitions cited above, can be found in the EUCALAND glossary:

Kruse, A. (ed.), Centeri, Cs., Renes, H., Roth, M., Printsman, A., Palang, H., Benito Jorda, L., Velarde, M. D., Kruckenberg, H. 2010: Glossary on agricultural landscapes. Hungarian: Journal of Landscape Ecology (Special Issue): 99–127.

Olwig, K. R. 1996: Recovering the substantive nature of landscape. Annals of the Association of American geographers 86(4): 630–653.

Translations

Bosnia and Herzegovina: Pejzaž/okoliš

Bulgarian: Пандшафта

Croatian: Krajolik

Czech: Krajina

Danish: Landskab

Dutch: Landschap

Esperanto: Pejzaĝo

Estonian: Maastik

Finnish: Maisema

French: Paysage

German: Landschaft

Greek: Ανάλυση Τοπίου

Hebrew: נוף

Hungarian: Táj

Italian: Paesaggio

Icelandic: Landslag

Latvian: Ainava

Lithuanian: Kraštovaizdis

Montenegrin: Pejzaž

Polish: Krajobraz

Portuguese: Paisagem

Romanian: Peisaj

Russian: Пейзаж

Slovakian: Krajina

Slovenian: Krajina

Serbian: Пейзаж

Spanish: Paisaje

Swedish: Landskap

LANDSCAPE AWARENESS

Definition

Landscape awareness refers to deeper understanding of the value of landscapes, their role and changes to them, among the civil society, private organisations and public authorities. European Landscape Convention marks the importance of awareness-raising which is defined as a way of making clear the relations that exist between people's cadre de vie, the activities pursued by all parties in the course of their daily lives and the characteristics of the natural environment, housing and infrastructure (Council of Europe).

Related terms

Landscape character, Landscape identity, Landscape sensitivity

Keywords

Ecological awareness, Knowledge-spreading process, Perception



Figure 5. “Re-Storying the Landscape” landscape awareness-raising among children (Source: <http5>)

Source

Elaborated for COST RELY on the basis of the European Landscape Convention CEP-CDCPP: Council of Europe. 2000: European Landscape Convention. Council of Europe, Florence.

Translations

Bosnia and Herzegovina: Svijest o pejzažu/ okolišu

Bulgarian: Информираност относно ландшафта

Croatian: Svjesnost o krajoliku

Czech: Povědomí krajiny

Danish: Povædomí krajiny

Dutch: Landschapsbewustzijn

Esperanto: Konscienco pri pejzaĝo

Estonian: Teadlikkus

Finnish: Tietoisuus maisemasta

French: Participation publique considérant le paysage

German: Landschaftsbewusstsein

Greek: Κατανόηση Τοπίου

Hebrew: מודעות נוף

Hungarian: Tájélatatosság (*we do not really use it*)

Italian: Consapevolezza paesaggistica

Icelandic: Landslagsvitund

Latvian: Ainavas novērtējums

Lithuanian: Susirūpinimas kraštovaizdžiu (visuomenės, politinis...)

Montenegrin: Svijest o pejzažu

Polish: Świadomość krajobrazowa

Portuguese: Sensibilização paisagística, consciencialização paisagística

Romanian: Conştientizarea peisajului

Russian: Пейзажное осознание /

Информированность о ландшафте

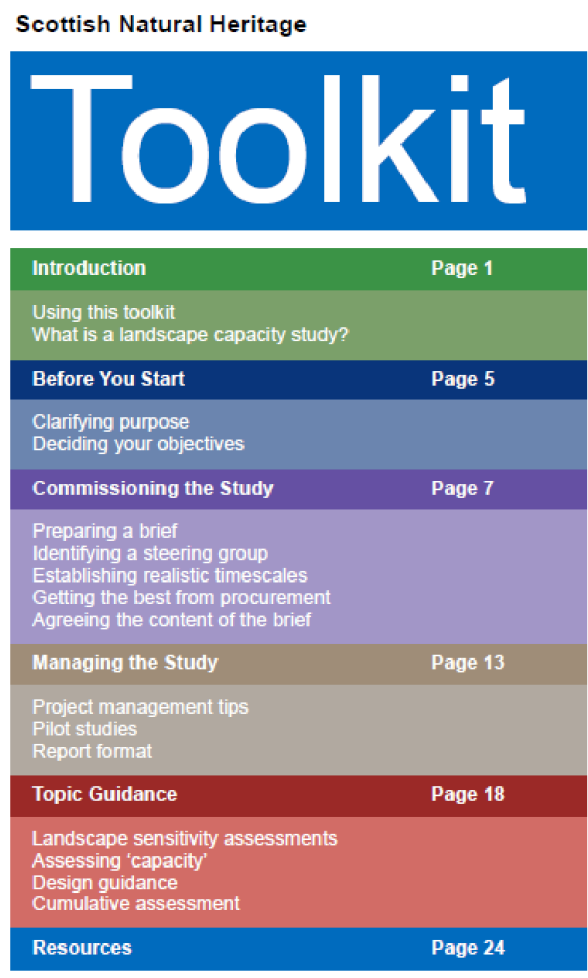
Slovakian: Povedomie o krajine (znalosť krajiny)

Slovenian: Zavedanje o krajini

Serbian: Свест и вредновање пејзажа

Spanish: Participación pública en relación con el paisaje

Swedish: Landskapsmedvetenhet

LANDSCAPE CAPACITY																																															
Definition Landscape capacity refers to the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed.																																															
Related terms Environmental Impact Assessment, Landscape sensitivity, Landscape service, Suitability of landscape for renewable energy production																																															
Keywords Magnitude of landscape change, Capacity thresholds, Landscape capacity thresholds																																															
 <p>The image shows the cover and table of contents for the 'Scottish Natural Heritage Toolkit'. The cover is blue with the word 'Toolkit' in large white letters. The table of contents lists the following sections and page numbers:</p> <table border="1"> <thead> <tr> <th>Section</th> <th>Page</th> </tr> </thead> <tbody> <tr> <td>Introduction</td> <td>Page 1</td> </tr> <tr> <td>Using this toolkit</td> <td></td> </tr> <tr> <td>What is a landscape capacity study?</td> <td></td> </tr> <tr> <td>Before You Start</td> <td>Page 5</td> </tr> <tr> <td>Clarifying purpose</td> <td></td> </tr> <tr> <td>Deciding your objectives</td> <td></td> </tr> <tr> <td>Commissioning the Study</td> <td>Page 7</td> </tr> <tr> <td>Preparing a brief</td> <td></td> </tr> <tr> <td>Identifying a steering group</td> <td></td> </tr> <tr> <td>Establishing realistic timescales</td> <td></td> </tr> <tr> <td>Getting the best from procurement</td> <td></td> </tr> <tr> <td>Agreeing the content of the brief</td> <td></td> </tr> <tr> <td>Managing the Study</td> <td>Page 13</td> </tr> <tr> <td>Project management tips</td> <td></td> </tr> <tr> <td>Pilot studies</td> <td></td> </tr> <tr> <td>Report format</td> <td></td> </tr> <tr> <td>Topic Guidance</td> <td>Page 18</td> </tr> <tr> <td>Landscape sensitivity assessments</td> <td></td> </tr> <tr> <td>Assessing 'capacity'</td> <td></td> </tr> <tr> <td>Design guidance</td> <td></td> </tr> <tr> <td>Cumulative assessment</td> <td></td> </tr> <tr> <td>Resources</td> <td>Page 24</td> </tr> </tbody> </table>		Section	Page	Introduction	Page 1	Using this toolkit		What is a landscape capacity study?		Before You Start	Page 5	Clarifying purpose		Deciding your objectives		Commissioning the Study	Page 7	Preparing a brief		Identifying a steering group		Establishing realistic timescales		Getting the best from procurement		Agreeing the content of the brief		Managing the Study	Page 13	Project management tips		Pilot studies		Report format		Topic Guidance	Page 18	Landscape sensitivity assessments		Assessing 'capacity'		Design guidance		Cumulative assessment		Resources	Page 24
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<p><i>Figure 6. Example of Landscape Capacity toolkit used by Scottish National Heritage (Source: http6)</i></p>																																															
Source Scottish Natural Heritage 2016: A Guide to Commissioning a Landscape Capacity Study. (http6:www.snh.gov.uk/docs/B858929.pdf)																																															

Translations

Bosnia and Herzegovina: Kapacitet pejzaža/ okoliša
 Bulgarian: Капацитет на ландшафта
 Croatian: Nosivost krajolika
 Czech: Únosnost krajiny
 Danish: Landskabskapacitet
 Dutch: Landschapscapaciteit
 Esperanto: Kapacito de pejzaĝo
 Estonian: Capacitatea peisajului
 Finnish: Maiseman kantokyky
 French: Capacité du paysage
 German: Tragfähigkeit der Landschaft
 Greek: Δυνατότητα αναμόρφωσης τοπίου
 Hebrew: קיבולת נופית
 Hungarian: Tájterhelhetőség

Italian: Capacità del paesaggio
 Icelandic: not used
 Latvian: Ainavas kapacitāte
 Lithuanian: Kraštovaizdžio pajėgumas
 Montenegrin: Kapacitet pejzaža
 Polish: Pojemność krajobrazu
 Portuguese: Capacidade paisagística
 Romanian: Capacitatea peisajului
 Russian: Ландшафтная вместимость
 Slovakian: Únosnosť krajiny
 Slovenian: Nosilna zmogljivost krajine
 Serbian: Капацитет пејзажа
 Spanish: Aptitud/Capacidad del paisaje
 Swedish: Landskapskapacitet

LANDSCAPE CHARACTER

Definition

The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape. It is a standard methodology for identifying, describing, classifying and mapping what is distinctive about landscapes. It is used in the assessment of landscape impacts for land use changes. For COST RELY, it is a basis of considering some of the landscape impacts of renewable energy developments (e.g. the UK).

Related term

Landscape identity

Keywords

Landscape Character Assessment, Landscape quality, Landscape value

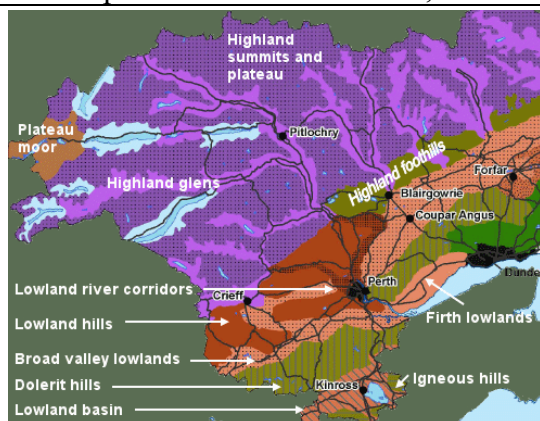


Figure 7a. Map of Landscape Character from Tayside Landscape Character Assessment, produced for Scottish Natural Heritage (Source: Perth and Kinross Council, UK)

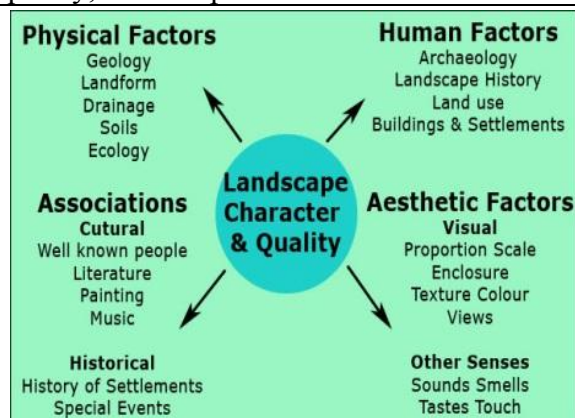


Figure 7b. Physical and perceptual characteristics to be considered in a Landscape Character Assessment (Source: <http://www.scotlandscotland.gov.uk>)

Source

Countryside Agency and Scottish Natural Heritage 2002: Landscape character assessment guidance for England and Scotland, Cheltenham, Countryside Agency; Edinburgh, Scottish Natural Heritage, Paragraph 7.8

Translations

Bosnia and Herzegovina: Karakter pejzaža/ okoliša
 Bulgarian: Характер на ландшафта
 Croatian: Karakter krajolika
 Czech: Krajinný ráz
 Danish: Landskabskarakter
 Dutch: Landschapskarakter
 Esperanto: Karaktero de pejzaĝo
 Estonian: Maastikukarakter
 Finnish: Maiseman Luonne
 French: Caractère du paysage
 German: Eigenart der Landschaft
 Greek: Χαρακτήρας τοπίου
 Hebrew: מאפיין נוף
 Hungarian: Tájkarakter

Italian: Carattere del paesaggio
 Icelandic: Landslagseinkenni / einkenni landslags
 Latvian: Ainavas raksturs
 Lithuanian: Kraštovaizdžio pobūdis
 Montenegrin: Karakter pejzaža
 Polish: Charakter krajobrazu
 Portuguese: Caracter da paisagem
 Romanian: Caracterul peisajului
 Russian: Ландшафтный характер
 Slovakian: Krajinný ráz
 Slovenian: Značaj krajine
 Serbian: Karakter pejzaža
 Spanish: Calidad/Caracter del paisaje
 Swedish: Landskapskarakter

LANDSCAPE CLASSIFICATION

Definition

Landscape classification is a means of grouping different types of landscapes into categories to address similar types at once. Classification is important for communication because it provides a consistent frame of reference. As the classification of landscapes is complicated by the fact that it involves both human perception and physical reality, there are many different attempts, according to nationality but also to scientific background. EUCALAND set-up a European Agricultural Landscape classification based on identity, pattern, process, change, spatial relationship, social organisation and topography with 10 different classes. Landscape classification is a basis of the research on landscape structure, process, and function, and also, the prerequisite for landscape evaluation, planning, protection, and management, directly affecting the precision and practicability of landscape research.

Related terms

Landscape character

Keywords

Landscape units

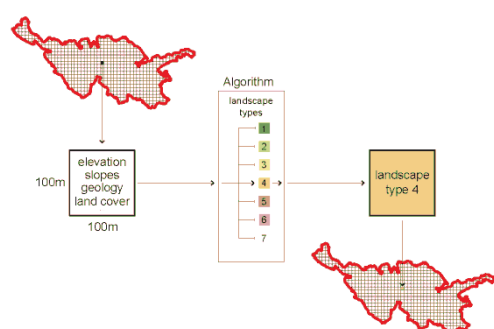


Figure 8a. Illustration of a method of classification using an algorithm
(Source: Bevk 2015)

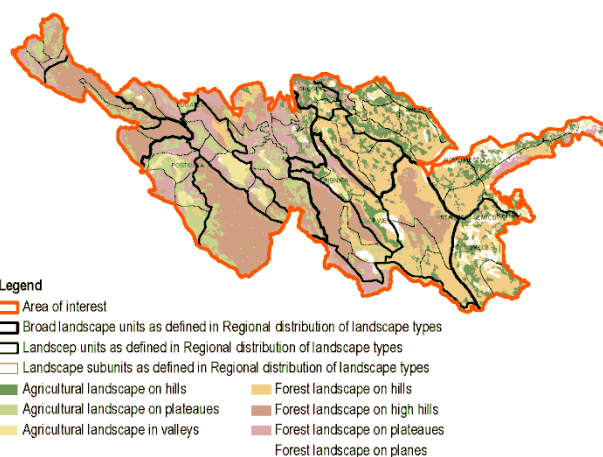


Figure 8b. Typology and regionalization of the Karst landscapes of in the selected area of inner Slovenia
(Source: Bevk 2015)

Source

Bevk, T. 2015: The use of automated classification for landscape typology in the case of regional distribution of landscape types in Slovenia : Master thesis. Biotechnical Faculty, University of Ljubljana, Ljubljana.
 Fairclough, G. 2010: Complexity and contingency: classifying the influence of agriculture on European landscapes. In: Pungetti, G., Kruse, A. (eds.) (2010): European Culture expressed in Agricultural Landscapes. Palombi Editori, Roma, pp. 115–148.

Translations

Bosnia and Herzegovina: Klasifikacija pejzaža/ okoliša
 Bulgarian: Класификация на ландшафта
 Croatian: Klasifikacija krajolika
 Czech: Klasifikace krajiny
 Danish: Landskabs klassifikation
 Dutch: Landschapsclassificatie
 Esperanto: Klasifiko de pejzaĝo
 Estonian: Maastiku klassifikatsioon
 Finnish: Maisemien luokittelu
 French: Classification du paysage
 German: Landschaftsklassifikation
 Greek: Κάταταξη τοπίου
 Hebrew: סיווג נופים
 Hungarian: Tájosztályozás

Italian: Classificazione del paesaggio
 Icelandic: Flokkun landslags / landslagsflokkun
 Latvian: Ainavas klasifikācija
 Lithuanian: Kraštovaizdžio klasifikacija
 Montenegrin: Klasifikacija pejzaža
 Polish: Klasyfikacja krajobrazu
 Portuguese: Classificação paisagística
 Romanian: Clasificarea peisajului
 Russian: Ландшафтная Класификация
 Slovakian: Klasifikácia krajiny
 Slovenian: Klasifikacija krajine
 Serbian: Класификација пејзажа
 Spanish: Clasificación del paisaje
 Swedish: Landskapsklassificering

LANDSCAPE FUNCTION

Definition

The flows of social, economic and ecological benefits that land may generate. In the context of Ecosystem Services, this can be described as the capacity of land for ecosystem service production.

Related terms

Landscape capacity, Landscape services

Keywords

Assessment, Landscape goods and services, Land-use functions, Multi-functional landscapes, Sustainability

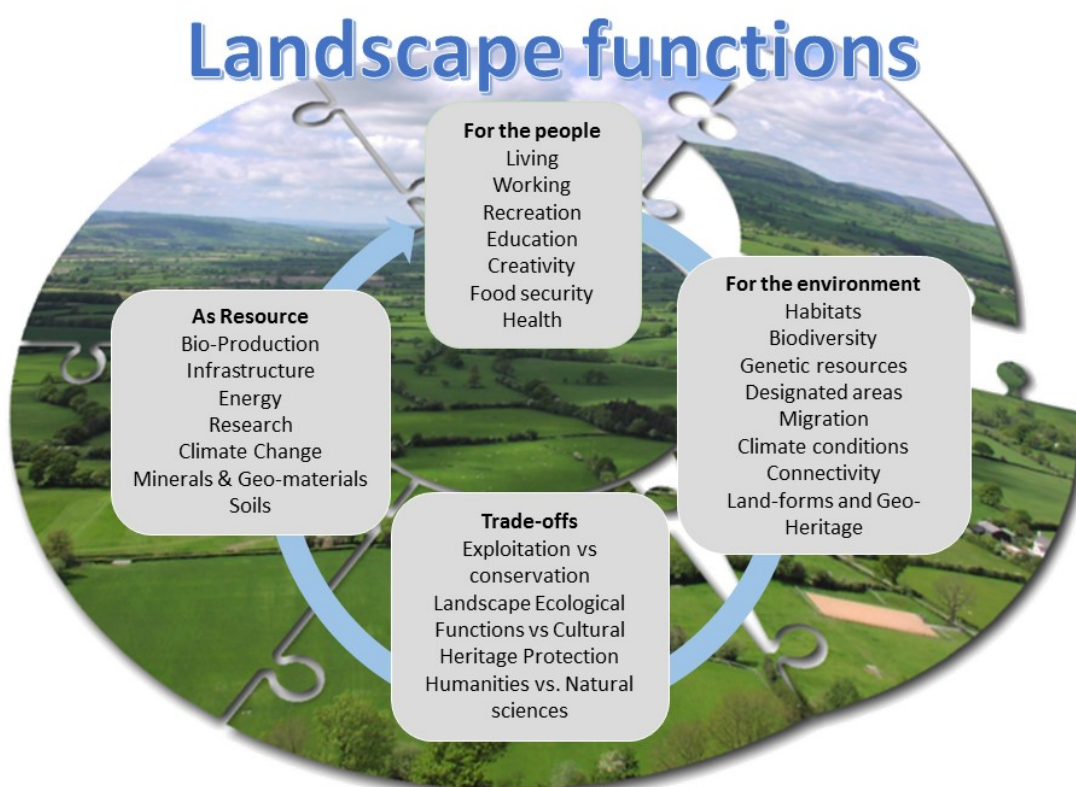


Figure 9. Landscapes have different functions for different stakeholders
(Graphic made by COST RELY: A. Kruse & J. M. Rojas)

Source

Bolliger, J., Kienast, F. 2010: Landscape Functions in a Changing Environment. *Landscape Online* 21: 1–5.
 Krovakova, K., Semerádova, S., Mudrochova, M., Skalos, J. 2015: Landscape functions and their change: a review on methodological approaches. *Ecological Engineering* 75: 378–383.
 Pérez-Soba, M., Petit S., Jones, L., Bertrand, N., Briquel, V., Omodei-Zorini, L., Contini, C., Helming, K., Farrington, J.H.M., Mossello, M.T., Wascher, D., Kienast, F., de Groot, R.S. 2008: Land use functions: a multifunctionality approach to assess the impact of land use changes on land use sustainability. In: Helming, K., Pérez-Soba, M., Tabbush, P. (eds.): *Sustainability impact assessment of land use changes*. Springer, Berlin Heidelberg, pp. 376–404.

Translations

Bosnia and Herzegovina: Namjena zemljišta/funkcija krajolika

Bulgarian: Ландшафтни функции (*Жозе М. Рояс*)

Croatian: Funkcija krajolika

Czech: Funkce krajiny

Danish: Landskabsfunktion

Dutch: Landschapsfuncties

Esperanto: Funkcio de pejzaĝo

Estonian: Maastiku funktsioonid

Finnish: Maiseman toiminnot

French: Fonction du paysage

German: Landschaftsfunktionen

Greek: Χρήση τοπίου

Hebrew: תפקוד נוף

Hungarian: Tájfunkció

Italian: Funzione del paesaggio

Icelandic: / not used

Latvian: Ainavas funkcija

Lithuanian: Kraštovaizdžio funkcijos

Montenegrin: Funkcija pejzaža

Polish: Funkcja krajobrazu

Portuguese: Regulação da paisagem

Romanian: Funcțiunea peisajului

Russian: Ландшафтная функция

Slovakian: Funkcie krajiny

Slovenian: Funkcija krajine

Serbian: Намена земљишта

Spanish: Funciones del paisaje

Swedish: Landskapsfunktion

LANDSCAPE IDENTITY

Definition

Landscape identity is related to the character and the tangible and intangible characteristics that shape the feeling of a person belonging to a landscape. Identity of a landscape is the sum of the different information layers drawing on for example the territory, cultural elements, natural resources, and current use.

The Spanish: key naturalists Martinez de Pison (2000) and Gonzalez Bernaldez (1981) have referred to this concept saying landscape identity comes with the person; it is a bag full of information of what we are carrying.

Related terms

Landscape awareness, Landscape resilience, Landscape sensitivity

Keywords

Attachment, Feeling of belonging, Motivation, People and place, Recognition, Roots, Sense of place



Figure 10. Orchards (or, allotment gardens, CSA (community supported agriculture) etc.) establish emotional relationships between people and territory, as well as among different groups of people. New feelings of belonging to a certain place emerge throughout the practice of farming itself or the fact of producing own food. This is a very ancient practice but certainly is being used in our current days to create connections between people and their place, to create new places and to live a place and it is widely adopted by young communities in urban backgrounds. Orchards in the South of Madrid, Olmeda de las Fuentes.

(Photo: Observatory for a Culture of the Territory 2009)

Source

Council of Europe. 2000: European Landscape Convention. Council of Europe, Florence.

http8: <http://www.snh.gov.uk/docs/B1118160.pdf>

Martinez de Pison, E. 2000: Estudios sobre el paisaje. Fundacion Duques de Soria - Ediciones Universidad Autonoma de Madrid, Madrid.

Gonzalez Bernaldez, E. 1981: Ecologia y Paisaje. Blume, Madrid.

Translations

Bosnia and Herzegovina: Identitet pejzaža/ okoliša
 Bulgarian: Ландшафтна идентичност
 Croatian: Identitet krajolika
 Czech: Identita krajín
 Danish: Landskabsidentitet
 Dutch: Landschappelijke identiteit
 Esperanto: Identeco de pejzaĝo
 Estonian: Maastiku identiteet
 Finnish: Maisemaidentiteetti
 French: Identité du paysage
 German: Landschaftsidentität
 Greek: Ταυτότητα Τοπίου
 Hebrew: זהות נוףית
 Hungarian: Táji identitás

Italian: Identità del paesaggio
 Icelandic: Ímynd landslags / landslagstengd sjálfsmynd
 Latvian: Ainavas identitāte
 Lithuanian: Kraštovaizdžio identitetas
 Montenegrin: Identitet pejzaža
 Polish: Tożsamość krajobrazowa
 Portuguese: Identidade de paisagem
 Romanian: Identitatea peisajului
 Russian: Ландшафтная идентичность
 Slovakian: Identita krajiny
 Slovenian: Identiteta krajine
 Serbian: Идентитет пејзажа
 Spanish: Identidad de paisaje/Identidad paisajística
 Swedish: Landskapsidentitet

LANDSCAPE QUALITY

Definition

The perception of the holistic environmental, cultural, sensory and psychological characteristics of a landscape with respect to their benefits or significance to people. It is relative, not absolute, requiring interpretation in the context of geographic scale (i.e. local, regional, national) and, or human experience.

Related terms

Landscape service

Keywords

Benefits, Landscape character, Landscape resource, Landscape value, Perception

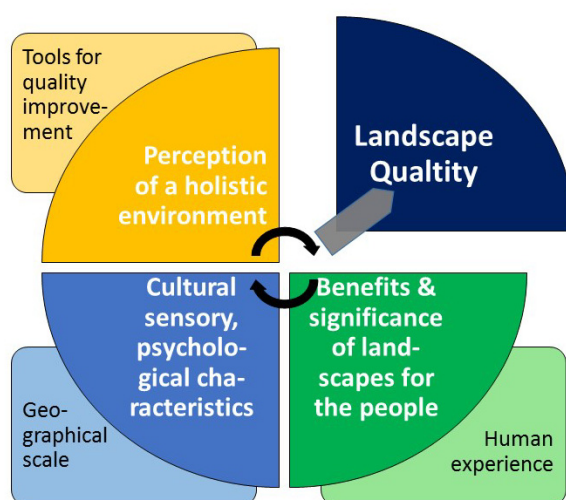


Figure 11. Landscape quality comprises different components and perception (Graphic made by COST RELY, A. Kruse)

Source

Definition developed by COST RELY Action, 2017.

Daniel, T.C. 2001: Whither scenic beauty? Visual landscape quality assessment in the 21st century. *Landscape and Urban Planning* 54: 267–281.

http9: www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-resource-library/glossary-of-terms/

Jacques, D.L. 1980: Landscape Appraisal: The Case for a Subjective Theory. *Journal of Environmental Management* 10: 107–113.

Translations

Bosnia and Herzegovina: Kvalitet pejzaža/ okoliša

Bulgarian: Качество на ландшафта

Croatian: Kvaliteta krajolika

Czech: Kvalita krajiny

Danish: Landskabskvalitet

Dutch: Landschapskwaliteit

Esperanto: Kvalito de pejzaĝo

Estonian: Maastiku kvaliteet

Finnish: Maiseman laatu

French: Qualité du paysage

German: Landschaftsqualität

Greek: Ποιότητα τοπίου

Hebrew: הנוף איכות

Hungarian: Tájminőség és

Italian: Qualità del paesaggio

Icelandic: Gæði landslags

Latvian: Ainavas kvalitāte

Lithuanian: Kraštovaizdžio kokybė

Montenegrin: Kvalitet pejzaža

Polish: Jakość krajobrazu

Portuguese: Qualidade paisagística e avaliação de características

Romanian: Calitatea peisajului

Russian: Качество ландшафта

Slovakian: Kvalita krajiny

Slovenian: Kakovost krajine

Serbian: Квалитет пејзажа

Spanish: Calidad del Paisaje

Swedish: Landskapskvalitet

LANDSCAPE RESILIENCE

Definition

Landscape resilience is its capacity for renewal in a dynamic environment. Its characteristics are flexibility, adaptability, and ability to withstand change. In the context of COST RELY, such change focuses on renewable energy systems.

Related terms

Landscape assessment, Landscape capacity, Landscape governance, Landscape vulnerability

Keywords

Adaptation, Renewable energy landscape impact, Regeneration, Resistance, Risk*

*No definition of landscape risk is included in COST RELY as the pressures for change are those of renewable energy, while the term landscape risk is more commonly associated with natural hazards (e.g. earthquakes).



Figure 12. Yanweizhou Park gives new life to the riparian wetland of Jinhua City, China
(Source: Turenscape, http10)

Source

Gunderson, L.H. 2000: Ecological resilience — in theory and application. *Annual Review of Ecology and Systematics* 31: 425–439.

Translations

Bosnia and Herzegovina: Otpornost pejzaža/okoliša
Bulgarian: Устойчивост на ландшафта
Croatian: Otpornost krajolika
Czech: Přizpůsobivost krajiny
Danish: Landskabets robusthed
Dutch: Herstelvermogen van het landschap
Esperanto: Rezisteco (elasteco) de pejzaĝo
Estonian: Maastike säilenõtkus
Finnish: Maiseman resilienssi
French: Résilience du paysage
German: Resilienz der Landschaft
Greek: Αντοχή τοπίου
Hebrew: השפעה נופית
Hungarian: A táj ellenállóképessége/tájstabilitás
Italian: Resilienza del paesaggio

Icelandic: Seigla landslags / viðnámsþróttur landslags
Latvian: Ainavas elastīgums
Lithuanian: Kraštovaizdžio atsparumas
Montenegrin: Otpornost pejzaža
Polish: Odporność krajobrazu
Portuguese: Resiliência paisagística
Romanian: Reziliența peisajului
Russian: Устойчивость ландшафта
Slovakian: Prispôsobivosť krajiny
Slovenian: Odpornost krajine
Serbian: Резистентност околине
Spanish: Resiliencia del paisaje/Paisajes resilientes
Swedish: Landskaps resiliens

LANDSCAPE SENSITIVITY

Definition

The degree to which the character and qualities of the landscape are affected by specific types of development and land-use change. In the context of COST RELY, such change is the development of renewable energy systems.

Related terms

Landscape character, Landscape quality, Landscape vulnerability

Keywords

Capacity, Development, Planning

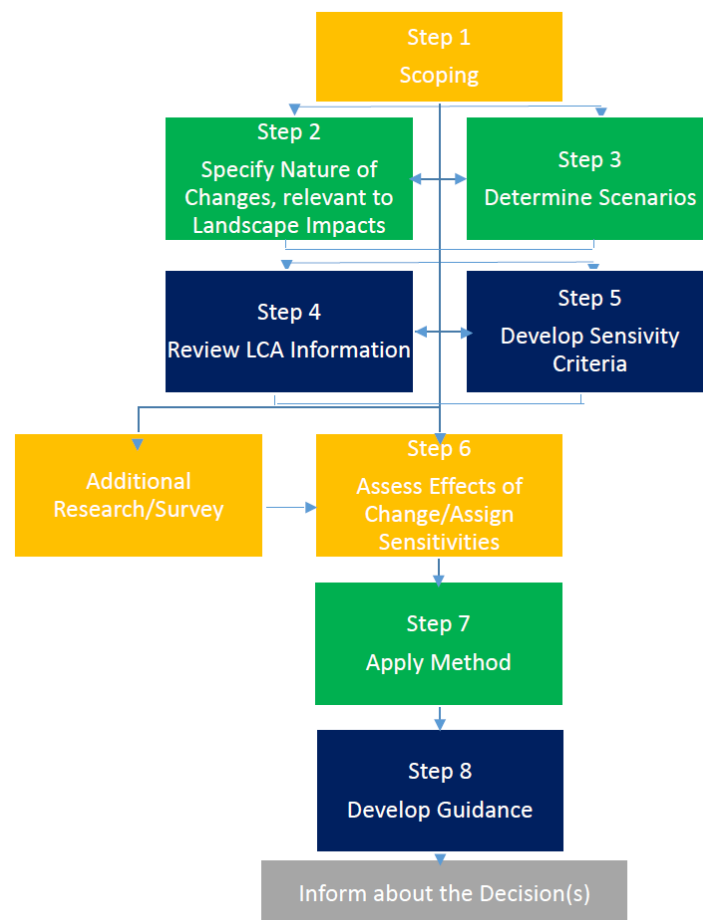


Figure 13. Steps in a landscape sensitivity study

(Source: Adapted by COST RELY, based on: Land Use Consultants (LUC), <http://www.luc.co.uk/>)

Source

Countryside Agency and Scottish Natural Heritage 2002: Landscape character assessment guidance for England and Scotland. Cheltenham, Countryside Agency; Edinburgh, Scottish Natural Heritage, Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity.

<http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-resource-library/glossary-of-terms/>

Translations

Bosnia and Herzegovina: Osjetljivost pejzaža/ okoliša
 Bulgarian: Чувствителност на ландшафта
 Croatian: Osjetljivost krajobraza
 Czech: Citlivost krajiny
 Danish: Landskabets sensitivitet
 Dutch: Gevoeligheid van het landschap
 Esperanto: Sentemeco de pejzaĝo
 Estonian: Maastiku tundlikkus
 Finnish: Maiseman herkkyyks
 French: Sensitivité du paysage
 German: Empfindlichkeit der Landschaft
 Greek: Ευαισθησία Τοπίου
 Hebrew: נופית רגישות
 Hungarian: Táji érzékenység

Italian: Sensibilità paesaggistica
 Icelandic: Næmi landslags
 Latvian: Ainavas jutīgums
 Lithuanian: Kraštovaizdžio jautrumas
 Montenegrin: Osjetljivost pejzaža
 Polish: Wrażliwość krajobrazu
 Portuguese: Sensibilidade da paisagem
 Romanian: Senzitivitatea peisajului
 Russian: Чувствительность ландшафта
 Slovakian: Citlivosť krajiny
 Slovenian: Občutljivost krajine
 Serbian: Сензитивност пејзажа
 Spanish: Susceptibilidad del paisaje
 Swedish: Landskaps känslighet

LANDSCAPE SERVICES

Definition

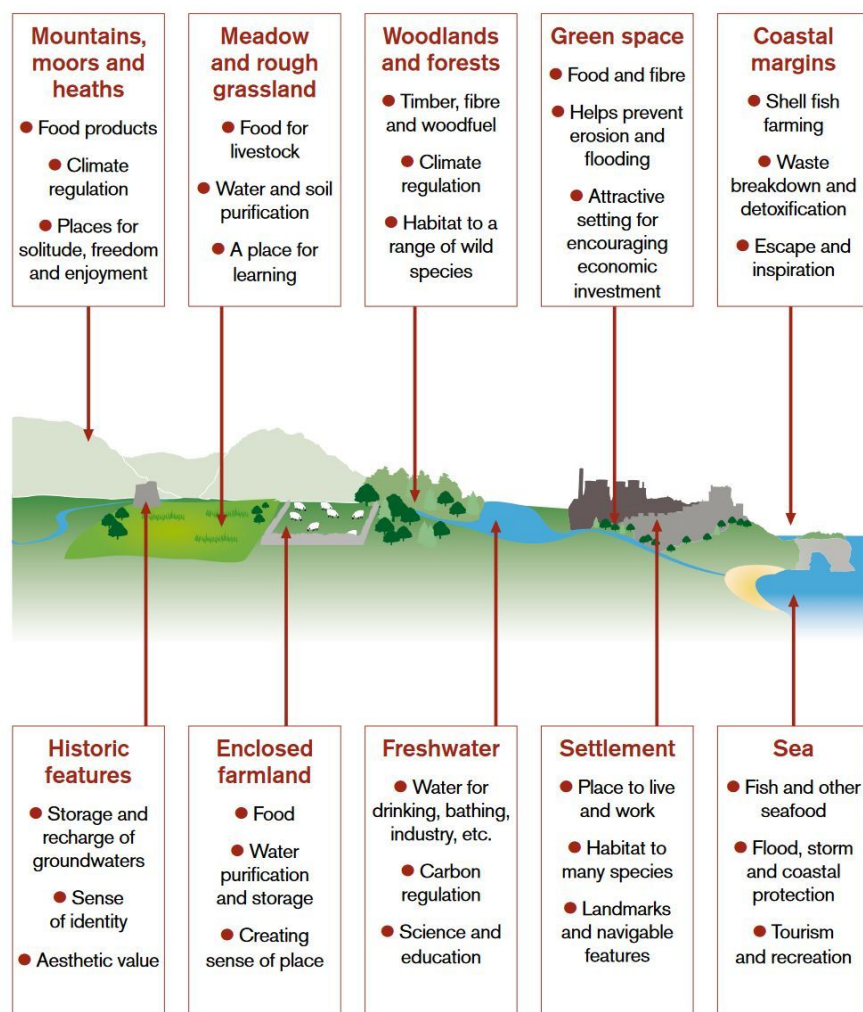
The contributions of landscapes and their components to human well-being. Landscape Services is a concept complementary to that of Ecosystem Services.

Related terms

Landscape function, Landscape services

Keywords

Landscape processes, Ecosystem services, Landscape scale



This diagram is adapted from the UK National Ecosystem Assessment (2011) UNEP-WCMC

Figure 14. Landscape and their benefits (Source: SNH: [http12: http://www.snh.gov.uk](http://www.snh.gov.uk))

Source

Bastian, O., Grunewald, K., Syrbe, R-U., Walz, U., Wende, W. 2015: Landscape services: the concept and its practical relevance. *Landscape Ecology* 29: 1463–1479.

Valles-Planells, M., Galiana, F., Van Eetvelde, V. 2014: A Classification of Landscape Services to Support Local Landscape Planning. *Ecology and Society* 19(1): 44.

[http12: http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/communities/talking-about-our-place/](http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/communities/talking-about-our-place/)

Translations

Bosnia and Herzegovina: Uredjenje pejzaža/ okoliša
 Bulgarian: Ландшафтни услуги
 Croatian: Uslužne funkcije krajobraza
 Czech: Služba krajiny
 Danish: Landskabsservice
 Dutch: Landschapsdiensten
 Esperanto: Servoj pri pejzaĝo
 Estonian: Aastikuteenused
 Finnish: Maiseman ekosysteemipalvelut
 French: Service du paysage
 German: Landschaftsdienstleistung
 Greek: Υπηρεσίες τοπίου
 Hebrew: הגוף שימורשי
 Hungarian: Táj szolgáltatások

Italian: Servizio del paesaggio
 Icelandic: þjónusta landslags
 Latvian: Ainavas pakalpojumi
 Lithuanian: Kraštovaizdžio paslaugos
 Montenegrin: Uredjenje pejzaža
 Polish: Usługi krajobrazowe
 Portuguese: Serviços da paisagem
 Romanian: Servicii în peisaj
 Russian: Ландшафтные услуги
 Slovakian: Služba krajiny
 Slovenian: Krajinske storitve
 Serbian: Уређење пејзажа
 Spanish: Servicios del paisaje
 Swedish: Landskapstjänst

LANDSCAPE VULNERABILITY

Definition

In landscape planning, vulnerability is defined as ‘vulnerability to impact’, and the likelihood of change to, or loss of, landscape features. Its level is a reflection of the significance of the functions of such features. In COST RELY it relates to the potential negative impact of renewable energy developments on landscapes.

Related terms

Landscape sensitivity

Keywords

Development constraints, Hazard, Impact models, Risk

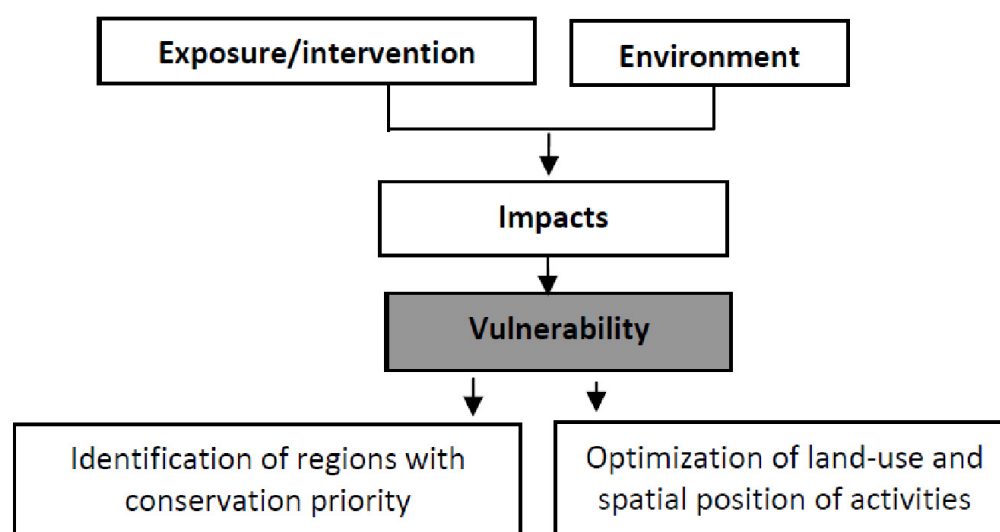


Figure 15. Vulnerability concept within the spatial planning context

(Source: Golobic, Breskvar Zaucer 2010)

Source

Golobic, M., Breskvar Zaucer, L. 2010: Landscape Planning and Vulnerability assessment in the Mediterranean; <http://www.pap-thecoastcentre.org/pdfs/Landscape%20Vulnerability.pdf>
Steinitz, C. 1967: Computers and regional planning: the DELMARVA study. MA: Graduate School of Design, Harvard University, Cambridge.

Translations

Bosnia and Herzegovina: Ranjivost pejzaža/ okoliša

Bulgarian: Уязвимост на ландшафта (Слободан миковски)

Croatian: Ranjivost krajobraza

Czech: Zranitelnost krajiny

Danish: Landskabets sårbarhed

Dutch: Kwetsbaarheid van het landschap

Esperanto: Vundebleco de pejzaĝo

Estonian: Maastiku haavatavus

Finnish: Maiseman haavoittuvuus

French: Vulnérabilité du paysage

German: Verletzlichkeit der Landschaft

Greek: Κίνδυνοι τοπίου

Hebrew: נופית פגיעות

Hungarian: Táji sérülékenység

Italian: Vulnerabilità del paesaggio

Icelandic: Viðkvæmni landslags

Latvian: Ainavas trauslums

Lithuanian: Kraštovaizdžio pažeidžiamumas

Montenegrin: Ranjivost pejzaža

Polish: Wrażliwość krajobrazu

Portuguese: Vulnerabilidade paisagística

Romanian: Vulnerabilitatea peisajului

Russian: Уязвимость ландшафта

Slovakian: Zraniteľnosť krajiny

Slovenian: Ranljivost krajine

Serbian: Рањивост пејзажа

Spanish: Vulnerabilidad del paisaje

Swedish: Landskaps sårbarhet

LAND USE CONFLICTS

Definition

A land use conflict is a situation where there is a disagreement on the use of a certain piece of land and/or a belief that people's rights or well-being are being threatened by an action or undertakings of another, or the inaction of another party.

The origins of most land use conflicts is when a land use, a project or an action is incompatible with the views, expectations and values of the people living, working and/or vacationing in a potentially affected area.

Related terms

Landscape governance, Planning process, Public participation, Stakeholder

Keywords

Disagreement, Dispute, Incompatibility, Dysfunctionality, Landscape conflict



Figure 16. Public protest against a proposed project of large wind park (130 wind turbines) at Nantucket Sound, Massachusetts (USA) taken on February 2, 2010 at Woods hole, MA

(Source: The Associated Press, [http13](http://13))

Source

Definition adapted from Learmonth, R., Whitehead, R., Boyd, W., Fletcher, S. 2007: Living and working in rural areas: a handbook for managing land use conflict issues on the NSW North Coast. Department of Primary Industries, Wollongbar.

Translations

Bosnia and Herzegovina: Konflikt namjene zemljišta
 Bulgarian: Конфликт при използването на земите
 Croatian: Konflikt namjene zemljišta
 Czech: Konflikt o využití krajiny
 Danish: Arealanvendelses konflikt
 Dutch: Landgebruiksconflict
 Esperanto: Konflikto pri uzo de tero
 Estonian: Maakasutuskonflikt
 Finnish: Maankäyttökonfliktit
 French: Conflit dans l'exploitation du paysage
 German: Landnutzungskonflikt
 Greek: Διενέξεις χρήσης γής
 Hebrew: קרקע שימושי של קונפליקטים
 Hungarian: tájhasználati konfliktus
 Italian: Conflitto di uso del suolo

Icelandic: Átök um landnýtingu/ ágreiningur um landnýtingu
 Latvian: Zemes lietojuma konflikts
 Lithuanian: Žemėnaudos konfliktai
 Montenegrin: Konflikt korišćenja zemljišta
 Polish: Konflikty przestrzenne
 Portuguese: Conflito sobre uso de terra
 Romanian: Conflict în utilizarea terenului
 Russian: Конфликт землепользования
 Slovakian: Konflikt o využití zeme
 Slovenian: Konflikt med rabami zemljišč
 Serbian: Конфликти при коришћењу земљишта
 Spanish: Markanvändningskonflikt
 Swedish: markanvändningskonflikt

VISUAL IMPACT

Definition

Change to the appearance of the landscape as a result of a development which can be positive (improvement) or negative (detraction) and the associated changes in the human visual experience of the landscape.

Related terms

Landscape assessment, Landscape capacity, Visual assessment, Visual impact assessment,

Keywords

Scenery, Visual amenity, Viewsheds



Figure 17. This former natural landscape on Iceland is now dominated through energy production by hydro power (Photo: Alexandra Kruse 2016)

Source

IEA and the Landscape Institute 1995: Guidelines for landscape and visual impact assessment. E and FN Spon, London.

Translations

Bosnia and Herzegovina: Vizuelni uticaju/utjecaji
 Bulgarian: Визуална оценка на въздействието
 Croatian: Vizualni utjecaj
 Czech: Vizální dopad
 Danish: Virsuelle konsekvenser
 Dutch: Visueel effect of visuele invloed (*of hinder*)
 Esperanto: Vida influo
 Estonian: Visuaalne mõju
 Finnish: Visuaalinen vaikutus
 French: Impact visuel
 German: Visuelle Beeinträchtigung
 Greek: Οπτική επιβάρυνση
 Hebrew: הזנת חזותית
 Hungarian: Vizuális hatás

Italian: Impatto visivo
 Icelandic: Sjónræn áhrif
 Latvian: Vizuālā ietekme
 Lithuanian: Vizualinis poveikis
 Montenegrin: Vizualni uticaj
 Polish: Oddziaływanie wizualne
 Portuguese: Impacto visual
 Romanian: Impact vizual
 Russian: Визуальное воздействие
 Slovakian: Vizuálny impakt
 Slovenian: Vpliv na vidne kakovosti
 Serbian: Визуелни утицај
 Spanish: Impacto visual
 Swedish: Visuellt påverkan

BIOFUEL

Definition

A biofuel is any fuel whose energy is obtained through a process of biological carbon fixation. To be considered a biofuel it must contain over 80 % renewable materials. It can be derived directly from plants, or indirectly from agricultural, commercial, domestic, and/or industrial wastes.

Biofuels generally involve carbon fixation through the process of photosynthesis. It is produced by conversion from biomass in three different ways:

- a) thermal,
- b) chemical and
- c) biochemical.

Biofuel can be solid, liquid or gaseous. The most common types of biofuels are bioethanol and biodiesel, which are predominantly used in the transport and heating sectors.

Related terms

Biomass, Biogas

Keywords

Carbon fixation, Bioethanol, Biodiesel, Transportation fuel, Heating fuel

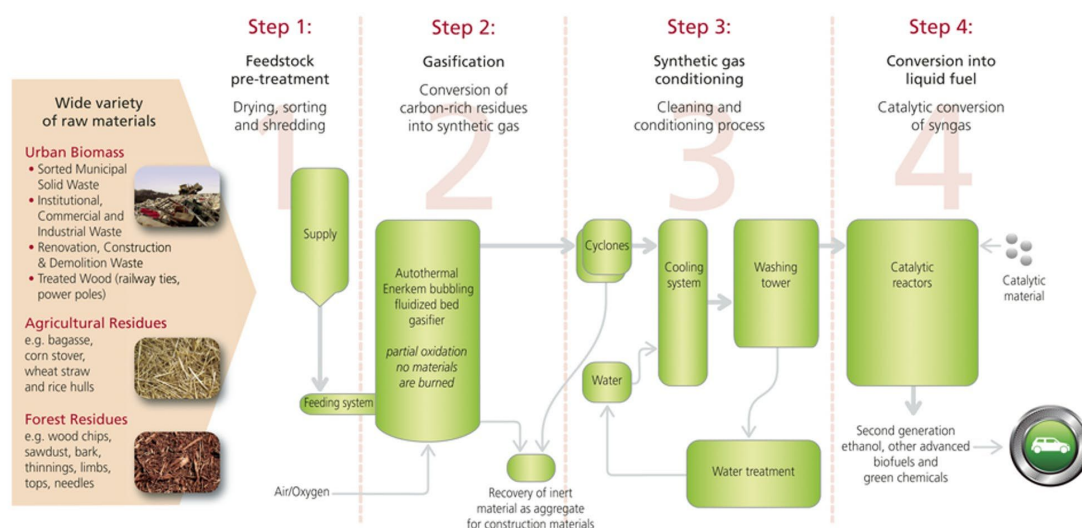


Figure 18. Scheme of production of biofuels from the waste (Source: <http://14>)

Source

http15: <http://biofuel.org.uk/glossary.html>

http16: <https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels>

http17: <http://www.alternative-energy-news.info/technology/biofuels/>

http18: www.gov.uk/guidance/industrial-energy-and-non-food-crops-business-opportunities-for-farmers

Translations Bosnia and Herzegovina: Biogorivo Bulgarian: Биогориво Croatian: Biogorivo Czech: Biopalivo Danish: Biobrændsel Dutch: Biobrandstof Esperanto: Biofuelo Estonian: Biokütus Finnish: Biopolttoaine French: Bio combustible German: Biokraftstoff Greek: Βιοκαύσιμο Hebrew: ביולוגיים דלקים Hungarian: Bioüzemanyag, agroüzemanyag	Italian: Biocombustibile Icelandic: Lífeldsneyti Latvian: Biodegviela Lithuanian: Biokuras Montenegrin: Biogorivo Polish: Biopaliwo Portuguese: Biocombustível Romanian: Biocombustibil Russian: Биотопливо Slovakian: Biopalivo Slovenian: Biogorivo Serbian: Биогориво Spanish: Informes técnicos Swedish: Biobränsle
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BIOGAS

Definition

Biogas is produced by anaerobic digestion (AD) which is the breakdown of organic material by micro-organisms in the absence of oxygen. Suitable organic materials include animal manure, sewage sludge, the organic fractions of household and industrial waste, or energy crops.

The calorific value of biogas is linked to characteristics of the inputs. For example, a high content of sugar and fat will result in biogas with a high calorific value.

Related terms

Biomass, Biofuel

Keywords

Methane, Landfill gas, Agricultural wastes, GHG emissions

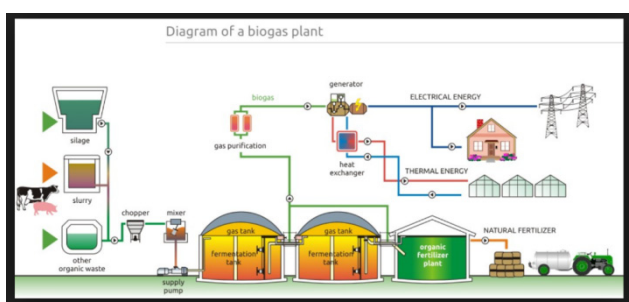


Figure 19a. Diagram of a biogas plant (Source: <http19>)

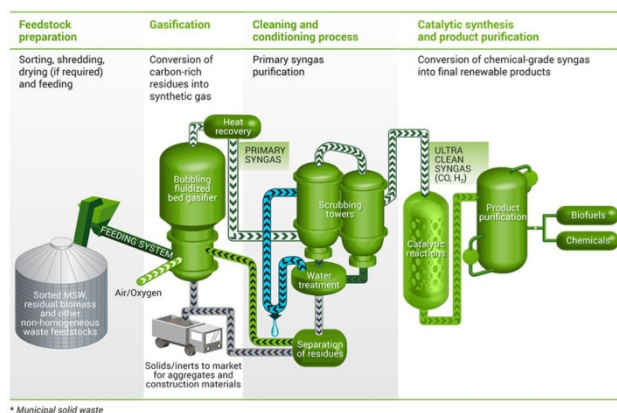


Figure 19b. Scheme of biogas production in industrial style (Source: <http20>, permission by Enerkem)



Figure 19c. Bigger biogas plant on a farm in Oberscheid, Germany (Photo: Alexandra Kruse 2016)



Figure 19d. Full-scale biofuel facility in Edmonton, Canada
Publication permission by Enerkem (Source: <http20>)

Source

<http21>: www.biogas-info.co.uk/ (UK Government portal on aerobic digestion)

<http22>: <http://european-biogas.eu/biogas/> (European Biogas Association)

Translations Bosnia and Herzegovina: Biogas Bulgarian: Биогаз Croatian: Bioplin Czech: Bioplyn Danish: Biogas Dutch: Biogas Esperanto: Biogaso Estonian: Biogaas Finnish: Biokaasu French: Biogaz German: Biogas Greek: Βιοαέριο Hebrew: ביוגז Hungarian: Biogáz	Italian: Biogas Icelandic: Lífgas Latvian: Biogāze Lithuanian: Biodujos Montenegrin: Biogas Polish: Biogaz Portuguese: Biogás Romanian: Biogaz Russian: Биогаз Slovakian: Bioplyn Slovenian: Bioplin Serbian: Биогас Spanish: Biogás Swedish: Biogas
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BIOMASS

Definition

From an ecological point of view, biomass is the total amount of living matter that exists in an ecosystem or in an animal or plant population. It is derived from organic material such as trees, plants, and agricultural and urban waste.

- (a) Agricultural crops, i.e. those grown for energy production, in Europe are predominantly herbaceous crops (e.g. miscanthus, reed canary grass, giant reed), oil seeds (e.g. rape seed, sunflower), sugar crops (e.g. sugar cane, sweet sorghum), and starch crops (e.g. maize, wheat), straw;
- (b) Forestry crops, which are predominantly short rotation plantation (e.g. willow, poplar and eucalyptus), and forest by-products (e.g. wood chips and blocks); agricultural wood production (e.g. vineyard, olive groves, orchards);
- (c) Industrial residues, such as industrial wood waste, sawdust from sawmills, fibrous vegetable waste from paper industries;
- (d) Waste, from parks and domestic gardens, demolition wood, biodegradable landfill waste, sewage sludge, municipal solid waste.

These various sources of biomass can be treated by chemical, biochemical or thermochemical processes to produce energy to generate renewable electricity or heat. They are chopped, chipped, pelleted or baled before being:

- burnt in a stove or boiler,
- mixed with coal for use in a conventional power station and
- used in a dedicated biomass power station.

Energy crops can also be grown for use in an anaerobic digester, where the organic material is broken down to produce biogas for heat and power.

Related terms

Biofuels, Biogas

Keywords

Bioenergy, Land use for energy



Figure 20a. Non-food, perennial biomass, crops such as willows and miscanthus can contribute to the reduction of CO₂ and play a role in mitigation against climate change
(Source: Test fields at Szent István University/HU Alexandra Kruse 2017)

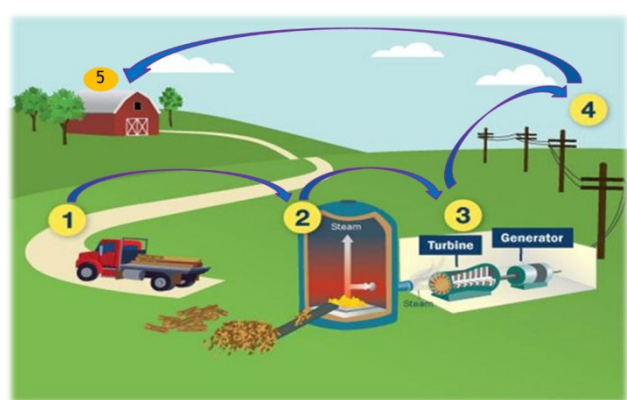


Figure 20b. Biomass power plant – Scheme
(Source: [http23](http://23))

Source Definition developed by COST RELY Action.	
Translations Bosnia and Herzegovina: Biomasa Bulgarian: Биомаса Croatian: Biomasa Czech: Biomasa Danish: Biomasse Dutch: Biomassa Esperanto: Biomaso Estonian: Biomass Finnish: Biomassa French: Biomasse (<i>énergie</i>) German: Biomasse Greek: Βιομάζα Hebrew: ביומס Hungarian: Biomassza	Italian: Biomassa Icelandic: Lífmassi Latvian: Biomasa Lithuanian: Biomasė Montenegrin: Biomasa Polish: Biomasa Portuguese: Biomassa Romanian: Biomasă Russian: Биомасса Slovakian: Biomasa Slovenian: Biomasa Serbian: Биомаса Spanish: Biomasa Swedish: Biomassa

ENVIRONMENTAL THERMAL ENERGY SOURCE

Definition

Environmental thermal energy source refers to the availability of very low enthalpy of air (aerothermal), water (hydrothermal) and ground (geothermal) that can be commonly exploited as a heat source by convertible heat pump systems. This energy can be used either for air conditioning or producing the hot water. Its benefits include zero CO₂ emissions, inexhaustible source of energy, independence from external suppliers and low heating costs. Preconditions are large radiators for a low temperature system and good insulation of the building.

Ground-sourced energy can be utilised via heat pumps in two different ways. 1. Heat close to the surface is used (an uniformed year-round temperature) via a surface collector installed as a heating coil at a depth of 1.5 m extracts heat from the ground. 2. Heat recovery is possible with a space-saving geothermal probe. The geothermal heat is removed with special ground probes that go as far as 100metres deep into the earth (the area with the all-year-constant temperature of 10 °C).

Groundwater-source energy relies on the constant temperature of the groundwater. Exploitation is possible with a well.

Ambient-air-sourced energy can be utilized with heat pumps for heating purposes.

Related terms

Geothermal energy

Keywords

Air-source heat pumps, Ground coupled heat pumps, Ground- source heat exchangers, Surface water heat pumps



Figure 21a. Air source heat pump, Ferrara
(Photo: M. Bottarelli 2017)



Figure 21b. Water heat exchanger using a pond
(Photo: http24)

Source

http25: www.ehpa.org (European Heat Pump Association)

http26: <http://egec.info/> (European Geothermal Energy Council)

Somogyi, V., Sebestyén, V., Nagy, G. 2017: Scientific achievements and regulation of shallow geothermal systems in six European countries – A review. Renewable and Sustainable Energy Reviews 68: 934–952.

Yang, H., Cui, P., Fang, Z. 2010: Vertical-borehole ground-coupled heat pumps: A review of models and systems. Applied Energy 87(1): 16–27.

Translations

Bosnia and Herzegovina: Izvori toplotne energije u prirodnom okruženju/okolišu

Bulgarian: Източник на термална енергия от ОС

Croatian: Toplinski izvor energije iz okoliša

Czech: Zdroj tepelné energie z životního prostředí

Danish: Miljøtermisk energiressource

Dutch: Omgevingswarmte

Esperanto: Fonto de varma energio el medio (grunto, akvo, aero)

Estonian: Maasoojuspump

Finnish: Maalämpö

French: Source d'énergie thermique environnementale

German: Lantentwärmenutzung

Greek: Περιβαλλοντική θερμική Ενέργεια

Hebrew: סביבתי-תרמי אנרגיה מקור

Hungarian: Környezethő energiaforrás

Italian: Fonte energetica da risorsa termale/ Sorgente di energia termica naturale

Icelandic: not used

Latvian: Termālie vides enerģijas avoti

Lithuanian: Aplinkos šiluminės energijos šaltinis

Montenegrin: Toplotni izvori iz životne sredine

Polish: Źródło energii cieplnej otoczenia np. grunt, woda, powietrze

Portuguese: Fonte de energia térmica ambiental

Romanian: Sursă de energie termală a mediului

Russian: Источник экологической тепловой энергии

Slovakian: Zdroj tepelnej energie zo životného prostredia

Slovenian: Toplotni vir iz okolja

Serbian: Амбијент у својству топлотног извора

Spanish: Energía termica ambiental (hidro-termica, aerotermica o geotermica)

Swedish: Miljömässig termisk energikälla

GEOTHERMAL ENERGY

Definition

Geothermal energy is energy stored in the form of heat below the earth's surface. It is used as a source for renewable electricity and heat with liquid water or steam as a carrier.

Related terms

Environmental thermal energy source

Keywords

Renewable heat



Figure 22a. Geothermal energy plant in Krafla, Northeast Iceland (Photo: David Ostman 2017)



Figure 22b. Geothermal energy plant in Hengill, Southwest Iceland (Photo: David Ostman 2017)

Source

http27: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_geothermal
(EU Research and Innovation, Geothermal Energy)

Translations

Bosnia and Herzegovina: Geotermalna energija
Bulgarian: Геотермална централа / геотермал-на енергия
Croatian: Geotermalna energija
Czech: Geotermální energie
Danish: Geotermisk energi
Dutch: Geothermie
Esperanto: Subtera varma energio
Estonian: Geotermalaenergia / geotermiline energia; maapõueenergia
Finnish: 'Maalämpövoima
French: Energie géothermale
German: Geothermie
Greek: Παραγωγή ηλεκτρισμού από γεωθερμία
Hebrew: גאותרמית אנרגיה

Hungarian: Geotermális energia
Italian: Energia geotermica
Icelandic: Jarðvarmaorka; jarðhitaorka
Latvian: Ģeotermālā enerģija
Lithuanian: Geoterminė energija
Montenegrin: Geotermalna energija
Polish: Energia geotermalna
Portuguese: Energia Geotermal/ Geotérmica
Romanian: Energie geotermală
Russian: Геотермальная энергия
Slovakian: Geotermálna energia
Slovenian: Geotermalna energija
Serbian: Геотермална енергија
Spanish: Energía geotérmica
Swedish: Geotermisk energi

HYDROPOWER

Definition

Moving water (kinetic energy) is used to produce electricity, referred to as hydropower.

Hydropower generation is categorized in relation to the: (i) means of storage, (ii) movement of the water. There are two broad types of hydro-power, run-of the river and reservoir. Reservoir is subdivided into storage reservoir and pumped storage.

The energy produced is classified according to their energy production capacity, expressed in megawatts. The two types of hydropower are associated with differ capacities of energy production, described below.

Large scale hydropower generation requires water storage provided by natural or man-made lakes or reservoirs, which are dammed to retain and regulate water for later release for power generation for domestic and industrial use. Globally, the hydropower scheme with the largest installed capacity is the Three Gorges Dam, China (22,500 MW), and the largest in Europe is the Iron Gates I, Romania (2,250MW).

Small scale hydropower is characterised by the capture of energy in flowing water (run of the river), with an upper limit of 10MW to 30MW depending upon country. The power of the scheme is proportional to the flow and the head: 1. Flow - the minimum amount of water that is constantly available throughout the year, and 2. Head - the vertical distance between the flow intake and the turbine. This definition includes micro hydropower that is considered to be an installation of 300kW or less, depending upon country.

Related terms

Marine Energy

Keywords

Hydroelectric, Water energy



Figure 23a. Micro hydro power in Eftimie Murgu village, Caraș Severin county, Romania
(Photo: Maria Bostenaru Dan 2008)



Figure 23b. Large hydro power plant Alqueva II in Portugal (Photo: Naja Marot 2015)

Source

Eurelectric 2011: Hydro in Europe: Powering Renewables. Union of the Electricity Industry, Brussels. p. 66.

http28: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_hydro

http29: www.small-hydro.com/about/small-scale-hydropower.aspx

<p>Translations for small and micro hydropower</p> <p>Bosnia and Herzegovina: Male i mikro hidroelektrane Bulgarian: Малка и средна хидроцентрала Croatian: Male i mikro hidroelektrane Czech: Malá a extrémně malá vodní energie Danish: Lille og micro vandkraft Dutch: Kleine en mico waterkracht Esperanto: Malgranda kaj mikro akvoelektrejo Estonian: Väikehüdroelektrijaamad Finnish: Pienvesivoima French: Energie hydraulique de petite et moyenne taille German: Mini- und Kleinstwasserkraftwerke Greek: Μικρά Υδροηλεκτρικά Hebrew: וקטן בינוני הידרואלקטרית אנרגיה לייצור מתקן Hungarian: Kis és mikro vízerőmű</p>	<p>Hungarian: Kis és mikro vízerőmű Italian: Mini e micro idroelettrico Icelandic: Smá- og örvirkjanir Latvian: Mazā un mikro hidroelektrostacija Lithuanian: Mažosios ir mikro hidroelektrinės Montenegrin: Mala i mikro hidroelektrana Polish: Mała i mikro- elektrownia wodna Portuguese: Pequenas e micro hidroelétricas Romanian: Micro- și minihidrocentrale Russian: Малая и средняя гидроэлектростанция Slovakian: Malé a mikro-vodné elektrárne Slovenian: Mala in mikro hidroelektrarna Serbian: Male hidroelektrane Spanish: Energía hidroeléctrica a pequeña escala Swedish: Liten och mikro vattenkraft</p>
<p>Translations for Large hydropower</p> <p>Bosnia and Herzegovina: Velike hidroelektrane Bulgarian: Голяма хидроцентрала Croatian: Velike hidroelektrane Czech: Velká vodní energie Danish: Større vandkraft Dutch: Grote waterkracht (-plant = -centrale) Esperanto: Granda akvoelektrejo Estonian: Hüdroelektrijaam Finnish: Suurvesivoima French: Energie hydraulique de grande taille / Grande hydraulique German: Großwasserkraft Greek: Μεγάλα υδροηλεκτρικά Hebrew: גדול בהיקף הידרואלקטרית אנרגיה לייצור מתקן Hungarian: Nagy vízerőmű</p>	<p>Italian: Grandi impianti idroelettrici / Idroelettrico a grande scala Icelandic: Stórar vatnsaflsvirkjanir Latvian: Lielā hidroelektrostacija Lithuanian: Didžiosios hidroelektrinės Montenegrin: Velika hidroelektrana Polish: Elektrownia wodna Portuguese: Grandes hidroelétricas Romanian: Hidrocentrale Russian: Крупномасштабная гидроэлектростанция Slovakian: Veľké vodné elektrárne Slovenian: Velika hidroelektrarna Serbian: Велике хидроелектране Spanish: Grandes centrales hidroeléctricas Swedish: Stor vattenkraft</p>

MARINE ENERGY

Definition

Marine energy is a common term for the energy of oceans, which can be either carried by ocean waves, ocean current, tidal stream and range, run-of-river, salinity and ocean temperature differences. It is also called marine power, ocean energy, ocean power, hydroelectricity, marine and hydrokinetic energy. Due to the proximity of oceans to the most populated locations in the world, oceans have a potential of providing a substantial amount of yet unutilized renewable energy. According to the Ocean Energy Europe (the largest network of ocean energy professionals – utilities, industrialists and research institutes), ocean energy can provide 10% of Europe's electricity by 2050. For this, the industry foresees to build 100 GW of production capacity.

Wave energy encompasses power from surface waves. The size of the waves generated will depend upon the wind speed, its duration, and the distance of water over which it blows (the fetch), bathymetry of the seafloor (which can focus or disperse the energy of the waves) and currents. The movement of water carries kinetic energy, which can be harnessed by wave energy devices. The optimal resources for the wave energy are in the offshore waters where waves are formed by the strong winds that have travelled long distances.

Tidal energy is energy harnessed from the kinetic energy of large bodies of moving water. Tidal streams causing this energy are formed due to the constantly changing gravitation pull of the moon and sun on the oceans. It is a constant movement, which can be due to the relative positions of the sun and moon predicted with perfect accuracy. The best areas for tidal stream exhaustion are areas with a good tidal range or in the narrow straits and inlets, around headlands, and in channels between islands where the speed of the currents are empowered due to the geomorphological funnelling effect.

Related terms

Hydropower, Wind energy

Keywords

Renewable energy

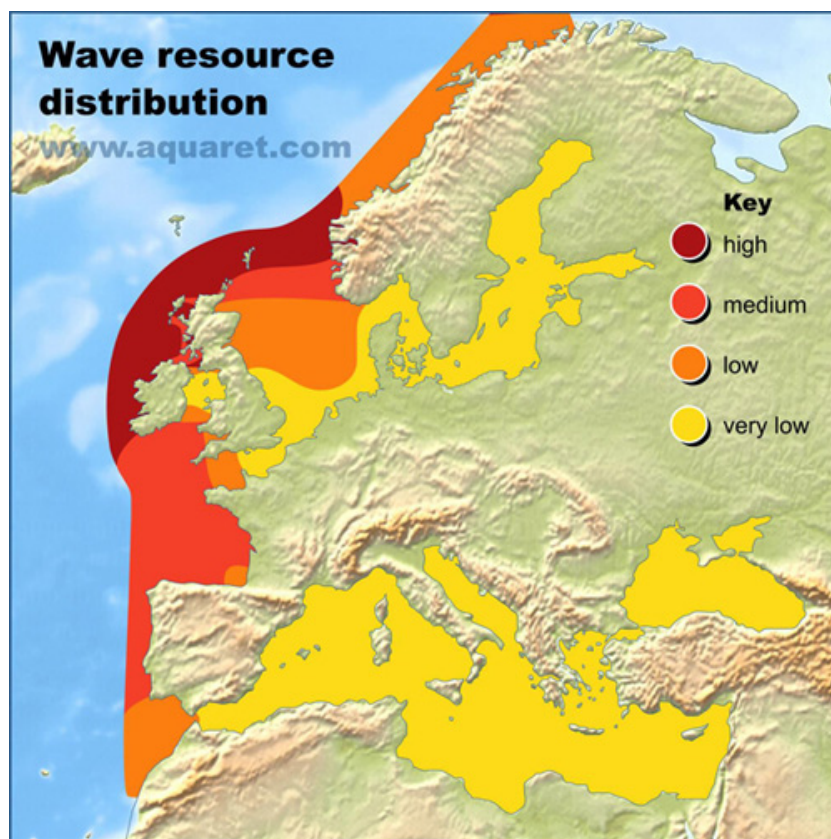


Figure 24. Wave resource distribution in Europe

(Source: <http30> via The European Marine Energy Centre 2017)

Source

<http31>: <http://www.emec.org.uk/marine-energy/> (The European Marine Energy Centre)

<http32>: <http://www.oceanenergy-europe.eu/> (Ocean Energy Europe)

Translations

Bosnia and Herzegovina: Energija talasa i morskih struja

Bulgarian: Енергия от морето

Croatian: Energija valova

Czech: Mořská energie

Danish: Havenergi (*energy på havet*)

Dutch: Maritieme energie

Esperanto: Energio de maro

Estonian: Mereenergia

Finnish: Aaltovoima

French: Energie marine

German: Marine Energie

Greek: Ενέργεια των Θαλασσών

Hebrew: גלים אנרגיית

Hungarian: Tengeri energia

Italian: Energia marina

Icelandic: Haforka

Latvian: Jūras enerģija

Lithuanian: Jūros energetika

Montenegrin: Energija talasa

Polish: Energia pływów morskich

Portuguese: Energia marinha

Romanian: Energie marină

Russian: Энергия океана, морская энергия

Slovakian: Morská energia

Slovenian: Energija morja

Serbian: Енергија таласа и морских струја

Spanish: Energía maremotriz

Swedish: Marin energi

PHOTOVOLTAIC

Definition

Photovoltaic technology is the means to convert the sun's radiation directly into electricity by solar cells. These cells are made of semiconducting materials similar to those used in computer chips. When sunlight is absorbed by these materials, the solar energy knocks electrons loose from their atoms, allowing the electrons to flow through the material to produce electricity. This process of converting light (photons) to electricity (voltage) is called the photovoltaic effect. Photovoltaic modules are connected in series and in parallels. The modules mostly have a frame, and the supporting structures are usually built out of galvanized steel or aluminium. The structures are attached to the ground via a foundation. Most of the time this type of systems are grid connected. We distinguish between two types of photovoltaics:

- a) On/in building-mounted photovoltaic
- b) On ground-mounted photovoltaic

To a): Photovoltaic modules connected in series and in parallel that are mounted onto or into the building's envelope, also called building added on photovoltaics (BAPV), or building attached photovoltaics-BAPV. Such photovoltaics do not use additional land area not included within the building's footprint neither do they have any building's function.

In the case of in buildings systems (so-called building integrated photovoltaics-BIPV) the photovoltaic modules replace conventional buildings' technological units; therefore photovoltaic components, suited for building integration have to be used to fulfil a number of functions, e.g. mechanical and thermal, standard photovoltaic modules cannot meet.

To b): The majority of the solar power installed today, is ground-mounted. Based on some solar capture optimization rules, the modules have generally a fixed orientation (normally South facing in the Northern hemisphere), and they are tilted to an optimal angle in order to maximize solar utilization. The distance between the rows of modules is designed so as to avoid shading effects while maximising the use of the available land.

There is no consensus on the size of an on ground PV system to be defined "utility scale" or "large". The nominal power of on ground PV systems varies greatly, from a few kWp up to hundreds of MWp.

In some countries, the authorization procedure for on ground PV systems is related to the size. In Italy, for example, a simplified procedure exists for systems smaller than 1MWp, whereas for systems larger than 1MWp, the environmental impact assessment procedure is required.

Related terms

Solar thermal, Solar thermoelectric

Keywords

Building Integrated Photovoltaics, Building Added Photovoltaics, Building Attached Photovoltaics

Photovoltaic's definition continues.



Figure 25a. Type a) Roof integrated photovoltaics, Tabià in Selva di Cadore (IT), designed by Exit. Special BIPV opaque components (modules + framing system) replace the traditional wooden tiles of the roof. (Photo: courtesy of Exit)



Figure 25b. Type a) Roof integrated photovoltaics. Glass-glass PV modules can be used in replacement of standard glazed surfaces (facades, roofs, skylights) in building's envelopes, coupled with standard framing systems. (Photo: courtesy of Ertex Solar)



Figure 25c. Type b) Waldpolenz solarpark (40MW), Leipzig (DE). This PV system is a typical example of a large scale PV; it is built on a former military area. The modules are arranged in a parallel stripes pattern, are E-W oriented, and face the South with an optimal tilt inclination of about 30°. (Photo: Juwi Solar GmbH)



Figure 25d. Type b) Agrinerie® (2.1 MWp), La Reunion (FR). It combines energy generation from PV and lemon grass production. This dual land use design pattern enabled the developers to get the approval for the realization of a system, since in French overseas islands it is not allowed to build on ground PV, because of land and landscape protection rules. (Photo: Akuo Energy)

Source

http33: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_solar

http34: <http://standards.globalspec.com/std/9996054/ds-en-50583-1>

Scognamiglio, A. 2012: Chapter 6 – Building-Integrated Photovoltaics (BIPV) for Cost-Effective Energy-Efficient Retrofitting, In: Pacheco-Torgal, F., Granqvist, C., Jelle, B., Vanoli, G., Bianco, N., Kurnitski, J. (eds.) Cost-Effective Energy Efficient Building Retrofitting. Woodhead Publishing, Sawston, Cambridge: pp. 169–197.

Scognamiglio, A., Bosisio, P., Di Dio, V. 2013: Fotovoltaico negli edifici, Edizione 2013 (Photovoltaics in buildings. Edition 2013). Edizioni Ambiente, Milano.

Translations: Solar PV ground-mounted power

Bosnia and Herzegovina: Samostojeći fotonaponski solarni paneli
 Bulgarian: Соларна централа монтирана на земята
 Croatian: Ugrađene solarne fotonaponske ćelije
 Czech: Sluneční fotovoltaická (FV) pozemní energie
 Danish: Solceller jordmonteret
 Dutch: Grondgebonden zonnepanelen (solar parks = zonneparken)
 Esperanto: Suna surtere muntita elektrejo
 Estonian: Päikesepaneelid (PV-paneelid) maapinnal
 Finnish: Aurinkopaneelit maassa (closest match)
 French: Énergie solaire photovoltaïque terrestre
 German: Solarpark oder Freiflächen-Photovoltaikanlage
 Greek: Φωτοβολταϊκά συστήματα στο έδαφος
 Hebrew: סולארית אנרגיה (PV) הקרקע על
 Hungarian: földre telepített napelem
 Italian: Impianto fotovoltaico a terra

Icelandic: Sólarrafhlöður á jörðu
 Latvian: Saules kolektors uz zemes
 Lithuanian: Antžeminės saulės jėgainės
 Montenegrin: Solarna FN elektrana montirana na zemljištu
 Polish: Naziemne panele fotowoltaiczne
 Portuguese: Energia solar fotovoltaica montada no solo
 Romanian: Energie solară fotovoltaică terestră
 Russian: Солнечные фотоэлектрические системы смонтированные наземно
 Slovakian: Slnecná fotovoltaická pozemná energia
 Slovenian: Sončna elektrarna na tleh / fotonapetostna elektrarna na tleh
 Serbian: Самостојећи фотонапонски соларни панели
 Spanish: Energía solar fotovoltaica sobre suelo
 Swedish: Sol PV markmonterad kraft

Translations: Solar PV on-roof power

Bosnia and Herzegovina: Krovni fotonaponski solarni paneli
 Bulgarian: Соларна централа монтирана на покривите
 Croatian: Krovne solarne fotonaponske ćelije
 Czech: Sluneční fotovoltaická (FV) střešní energie
 Danish: Solceller tagmonteret
 Dutch: Zonne panelen op het dak
 Esperanto: Suna surtegmente muntita elektrejo
 Estonian: Päikesepaneelid (PV-paneelid) katusel
 Finnish: Aurinkopaneelit katolla (closest match)
 French: Énergie solaire photovoltaïque sur des toits
 German: Photovoltaikanlage auf dem Dach
 Greek: Φωτοβολταϊκά συστήματα στις σκεπές
 Hebrew: סולארית אנרגיה (PV) גגות על
 Hungarian: Tetőre telepített napelem
 Italian: Impianto fotovoltaico su edificio
 Impianto fotovoltaico in copertura

Icelandic: Sólarrafhlöður á þaki
 Latvian: Saules kolektors uz jumta
 Lithuanian: Stogų saulės jėgainės
 Montenegrin: Solarna FN elektrana montirana na krovu
 Polish: Dachowe panele fotowoltaiczne
 Portuguese: Energia solar fotovoltaica instalada em telhados
 Romanian: Energie solară fotovoltaică pe acoperiş
 Russian: Солнечные фотоэлектрические системы смонтированные на здании
 Slovakian: Slnecná fotovoltaická strešná energia
 Slovenian: sončna elektrarna na strehi / fotonapetostna elektrarna na strehi
 Serbian: Кровни фотонапонски соларни панели
 Spanish: Energía solar fotovoltaica sobre cubierta/techo
 Swedish: Sol PV markmonterad kraft

SOLAR THERMAL

Definition

Solar energy utilization is used in applications associated with covering the heating and/or cooling requirements of buildings. These applications require low or medium temperature heat and include water heating, for either domestic hot water systems or swimming pools, space heating, and possibly also for space cooling. The main component is the solar thermal collector. The collector typically consists of a black absorber in which the absorbed solar radiation is converted to heat, which in turn is conducted to a fluid. The back and sides of the absorber are insulated and the front side is covered by a transparent cover that allows solar radiation to reach the absorber but reduces heat losses to the atmosphere. All the above, are encased in a metal housing that provides weather protection and offers structural support. Storage tanks are used to store heat in order to cover the loads when solar potential is low. The systems can be of two types:

- a) In/on building-mounted solar thermal
- b) On ground-mounted solar thermal

To a) In/on building-mounted solar heating systems for hot water production for sanitary use are the most common ones. Typical systems consist mainly of flat plate solar collectors, a storage tank, a mounding base and the necessary piping. Average annual system efficiency for the conversion of solar radiation to energy in form of hot water varies between 30–40%, depending mainly on the type of solar collector used and the location. Larger systems can be used in order to cover space heating needs or/and air conditioning of buildings.

To b) The technical principles of the on ground-mounted solar thermal are the same as under a), but the number of units requires a larger solar field that cannot be accommodated on the roof of buildings.

Related terms

Photovoltaic, Thermoelectric

Keywords

Domestic solar thermal systems, Hot water, Roof-top solar, Solar combi systems, Solar energy, Sun energy



Figure 26a. Type a) Domestic Solar Hot Water System on the roof of a building (Photo: Solahart/ESTIF 2016)



Figure 26b. Type b) Solar Thermal Collector field on the ground (Photo: ARCON/ESTIF 2016)

Source

Martinopoulos, G. 2016: Solar Energy in Buildings. In: Elias, S.A. (ed.) Reference Module in Earth Systems and Environmental Sciences, Elsevier, Amsterdam.

<p>Translations: Solar thermal ground-mounted power</p> <p>Bosnia and Herzegovina: Solarne termoelektrane-samostojeće</p> <p>Bulgarian: Соларно-топлинна централа монтирана земно</p> <p>Croatian: Ugrađeni solarni paneli</p> <p>Czech: Sluneční tepelná pozemní energie</p> <p>Danish: Solvarme jordmonteret</p> <p>Dutch: Thermische zonne-energie op de grond</p> <p>Esperanto: Suna surgrunde muntita varmizilo</p> <p>Estonian: Päikeseküte (maapinnal)</p> <p>Finnish: Aurinkokeräin maassa (closest match)</p> <p>French: Energie thermique solaire terrestre</p> <p>German: Solarthermie</p> <p>Greek: Ηλιακά θερμικά συστήματα παραγωγής ηλεκτρισμού</p> <p>Hebrew: הקרקע על תרמית אנרגיה</p>	<p>Hungarian: Földre telepített napkollektor</p> <p>Italian: Impianto solare termico a terra</p> <p>Icelandic: Sólarhitasöfnunarkerfi á jörðu</p> <p>Latvian: Saules termālie paneļi uz zemes</p> <p>Lithuanian: Antžeminės saulės šiluminės jėgainės</p> <p>Montenegrin: Solarne termalne elektrane na zemljištu</p> <p>Polish: Naziemne panele słoneczne</p> <p>Portuguese: Termoelétrica solar no solo</p> <p>Romanian: Energie termică solară terestră</p> <p>Russian: Солнечные термальные системы смонтированные наземно</p> <p>Slovakian: Pozemná solárna termálna energia</p> <p>Slovenian: Sončne termalne naprave na tleh</p> <p>Serbian: Соларне термоелектране</p> <p>Spanish: Energía termo-solar sobre suelo</p> <p>Swedish: Sol termisk markmonterad kraft</p>
<p>Translations: Solar thermal on-roof power</p> <p>Bosnia and Herzegovina: Solarne termalne elektrane na krovovima</p> <p>Bulgarian: Соларно-топлинна централа монтирана върху покривите</p> <p>Croatian: Krovni solarni paneli</p> <p>Czech: Sluneční tepelná střešní energie</p> <p>Danish: solvarme tagmonteret</p> <p>Dutch: thermische zonne-energie op het dak</p> <p>Esperanto: Suna surtegmenta varmizilo</p> <p>Estonian: päikeseküte (katusel)</p> <p>Finnish: Aurinkokeräin katolla (closest match)</p> <p>French: Energie thermique solaire sur des toits</p> <p>German: Thermische Solarkollektoren (Sonnenkollektoren) auf dem Dach</p> <p>Greek: Ηλιακά θερμικά συστήματα σε κτίρια</p> <p>Hebrew: גגות על תרמית אנרגיה</p>	<p>Hungarian: Tetőre telepített napkollektor</p> <p>Italian: Impianto solare termico su edificio</p> <p>Icelandic: Sólarhitasöfnunarkerfi á þaki</p> <p>Latvian: Saules termālie paneļi uz jumta</p> <p>Lithuanian: Stogų saulės šiluminės jėgainės</p> <p>Montenegrin: Solarne termalne elektrane na krovu</p> <p>Polish: Dachowe panele słoneczne</p> <p>Portuguese: Termoelétrica solar montada em telhados</p> <p>Romanian: Energie termică solară pe acoperiş</p> <p>Russian: Солнечные термальные системы смонтированные на здании</p> <p>Slovakian: Strešná solárna termálna energia</p> <p>Slovenian: Sončne termalne strešne naprave</p> <p>Serbian: Соларне термоелектране - кровне</p> <p>Spanish: Energía termo-solar sobre cubierta/techo</p> <p>Swedish: Sol termisk takmonterad kraft</p>

SOLAR THERMOELECTRIC

Definition

Solar thermoelectric (concentrated) power systems use a large array of mirrors and/or lenses to concentrate the sun's energy onto a focal point. In this way they transform the direct components of solar radiation into heat energy at high temperature. This heat energy is then converted into electricity for immediate use, and in some cases into energy that can be stored in the form of heat or in chemical form. There are currently four types of thermosolar technology of particular note because of their high degree of technological development: parabolic troughs, solar power towers, linear Fresnel concentrators and Stirling parabolic dishes. Each of these technologies has certain specific characteristics that help create different kinds of thermoelectric solar landscapes, although all these landscapes have a set of common features.

Related terms

Solar thermal, Photovoltaic

Keywords:

Sun energy, Lenses, Heat energy, Concentrated solar power (CSP), Concentrated solar thermal power, Industrial landscape, Agroindustrial landscapes



Figure 27. Solucar PS10 is the first solar thermal power plant in the world that generates electricity with this technique in a commercial way, near Seville, Spain (Photo: Naja Marot 2017)

Source

de Andrés-Ruiz, C., Iranzo-García, E., Espejo-Marín, C. 2015: Solar thermoelectric power landscapes in Spain: A new kind of renewable energy landscape? In: Frolova, M., Prados, M.-J., Nadaï, A. (eds.) *Renewable Energies and European Landscapes: Lessons from Southern European cases*. Springer, New York, London: pp. 237–254.

Translations	
Bosnia and Herzegovina: Termoelektrični solarni sistemi	Italian: Solare termoelettrico
Bulgarian: Соларна термоелектрическа централа	Icelandic: /not used
Croatian: Solarna termoelektrična energija	Latvian: Saules termoelektrība
Czech: Sluneční termoelektrická energie	Lithuanian: Saulės termoelektrinės
Danish: Termoelektrisk sol	Montenegrin: Solarna termoelektrana
Dutch: Thermo-elektrische zonne-energie	Polish: Ogniwo termoelektryczne
Esperanto: Suna varmelektrounuo	Portuguese: Termoeléctrica solar, Energia solar termoeléctrica
Estonian: Päikeseküte	Romanian: Termoelectricitate solară
Finnish: Aurinkokeräin	Russian: Концентрированная солнечная энергия
French: Thermoélectrique solaire	Slovakian: Slnčná termoelektrická energia
German: Solare Thermoelektrik	Slovenian: Sončna termoelektrika
Greek: Ηλιακά θερμιονικά συστήματα	Serbian: Термоелектрични соларни системи
Hebrew: סולארי-תרמו חשמל	Spanish: Energía solar termoeléctrica
Hungarian: Termoelektromos napelem	Swedish: Solar termoelektrisk

SUSTAINABLE RENEWABLE ENERGY PRODUCTION

Definition

The production of renewable energy in line with the principles of sustainability.

Economic sustainability encompasses the price of renewable energy production at sustainable levels, and efficient processes characterized by lower process requirements, capital and operating costs.

Social sustainability concerns social acceptance, energy democratization, and equality access to energy.

Environmental sustainability includes an assessment of the full environmental footprint of the renewable energy production (e.g. Life Cycle Assessment; Environment Impact Assessment). It also addresses land use requirements and whether renewable energy production is in competition with food production, habitats and biodiversity, or water supply and quality.

Cultural sustainability should conform to local cultural values and not adversely impact on cultural landscapes and heritage.

Related terms

Life Cycle Analysis, Environmental Impact Assessment, Social Impact Assessment

Keywords

Sustainable development

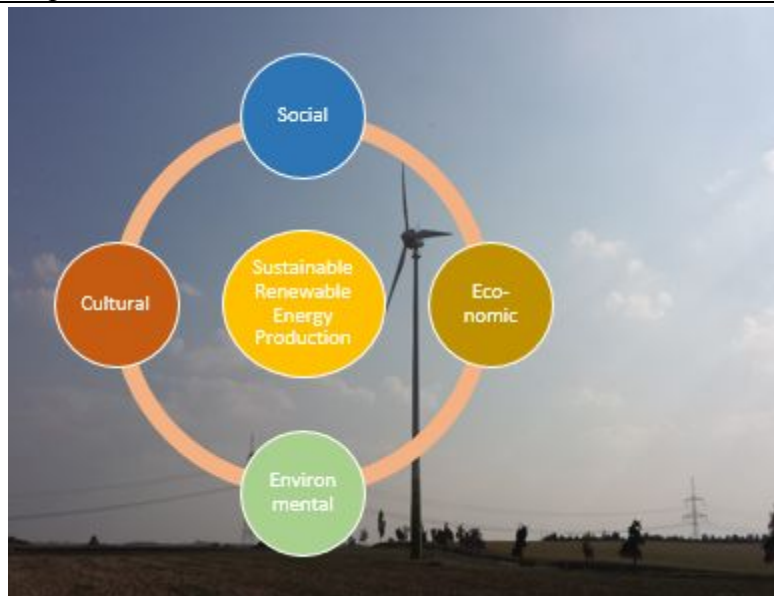


Figure 28. Sustainable Renewable Energy Production (Photo & Montage: Pia Otte 2016)

Source

Evans, A., Strezov, V., Evans, T.J. 2009: Assessment of sustainability indicators for renewable energy technologies. *Renewable and Sustainable Energy Reviews*, 19: 1082–1088.

Botelho, A., Pinto, L. M., Lourenço-Gomes, L., Valente, M., Sousa, S. 2016: Social sustainability of renewable energy sources in electricity production: An application of the contingent valuation method. *Sustainable Cities and Society*, 26: 429–437.

Translations

Bosnia and Herzegovina: Održiva proizvodnja energije iz obnovljivih izvora

Bulgarian: Устойчиво производство на възобновяема енергия

Croatian: Održiva proizvodnja energije obnovljivim izvorima

Czech: Udržitelná výroba obnovitelné energie

Danish: Bæredygtig vedvarende energiproduktion

Dutch: Duurzame hernieuwbare energieproductie

Esperanto: Daŭrigebla (ekvilibra) produktado de renovigebla energio

Estonian: Jätkusuutlik taastuva energia tootmine

Finnish: Kestävä uusiutuvan energian tuotanto

French: Production durable d'énergie renouvelable

German: Nachhaltige Produktion Erneuerbarer Energien

Greek: Βιώσιμη παραγωγή ενέργειας από ανανεώσιμες πηγές

Hebrew: מתחדשות אנרגיות של מקיים ייצור

Hungarian: Fenntartható megújulóenergia-termelés

Italian: Produzione energetica sostenibile da fonti rinnovabili

Icelandic: Sjálfbær vinnsla endurnýjanlegrar orku

Latvian: Ilgtspējīgas atjaunīgās enerģijas ražošana

Lithuanian: Tvari atsinaujinančios energijos gamyba

Montenegrin: Održiva proizvodnja iz obnovljivih izvora energije

Polish: Zrównowazona produkcja energii ze źródeł odnawialnych

Portuguese: Produção sustentável de energia renovável, Produção sustentada de energia a partir de fontes renováveis

Romanian: Producerea durabilă de energie regenerabilă

Russian: Производство возобновляемой энергии

Slovakian: Udržateľná výroba energie z obnoviteľných zdrojov

Slovenian: Trajnostna proizvodnja energije iz obnovljivih virov

Serbian: Одржива производња енергије из обновљивих извора

Spanish: Producción de energías renovables sostenible

Swedish: Hållbar produktion av förnybar energi

WIND ENERGY

Definition

Wind power refers to the extraction of kinetic energy from the wind to generate electricity.

In early 2017, the total installed capacity reached 153.7GW, placing wind energy as the second largest form of power generation capacity in Europe.

Wind energy generation is categorized by the type of wind turbine (horizontal or vertical axis), and the on- or off-shore location of the turbines. The predominant use is of horizontal axis turbines, with vertical axis turbines more commonly used in urban or built environments.

- (a) Onshore wind energy generation is land-based with developments ranging in the size (height of tower and diameter of rotor blades) and the number of turbines. Energy capacity of turbines (currently) range up to 3.6MW, with a rotor diameter of 130m. Developments may be classified as small, medium or large scale the definitions of which vary by country.
- (b) Offshore wind energy generation is marine, sea or lake, typically employing turbines of a larger capacity than onshore, with capacity up to 8MW, and a rotor diameter of 164m.

Related terms

Energy landscape, Visual impact, Visual impact assessment, Marine energy

Keywords

Wind farm, Wind park, Wind turbine



Figure 29a. Onshore wind farm near Diepholz, Germany, with the currently world's highest performing onshore wind turbine, i.e. the Enercon-126, with a hub height of 135m (443 ft), rotor diameter of 126m (413 ft) (Photo: Olaf Schroth 2015)

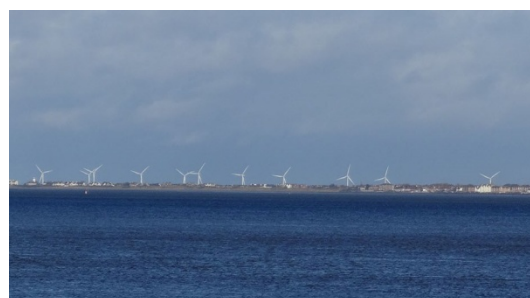


Figure 29b. Offshore wind production in Wirral Peninsula – West Kirby, Wales, United Kingdom (Photo: Elsie Roulston 2016)



Figure 29c. Old and new wind power use in Terras Altas de Fafe, Portugal (Photo: Filipa Soares 2013)

Source

http35: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_wind

http36: <https://windeurope.org/about-wind/statistics/>

<p>Translations: Wind onshore energy</p> <p>Bosnia and Herzegovina: Energija vjetra na kopnu Bulgarian: Енергия от вятърни генератори Croatian: Energija vjetra na kopnu/na obali Czech: Větrná vnitrozemská energie Danish: Landvindmøller Dutch: Wind op land Esperanto: Venta energio surtera Estonian: Maismaa tuuleenergia Finnish: Tuulivoima (general term) French: Énergie éolienne terrestre German: Onshore-Windenergie Greek: Αιολικό Πάρκο Hebrew: יבשתית רוח אנרגיית Hungarian: Szárazföldi szélenergia</p>	<p>Italian: Energia eolica on-shore Icelandic: Vindorka á landi Latvian: Sauszemes vēja enerģija Lithuanian: Vėjo energetika sausumoje Montenegrin: Energija vjetra na kopnu Polish: Energia wiatrowa on-shore Portuguese: Energia eólica em terra Romanian: Energie eoliană terestră Russian: Ветроэнергетика на суше Slovakian: Veterná energia Slovenian: Vetrna elektrarna na kopnem Serbian: Енергија ветра на копну Spanish: Energía eólica Swedish: Onshore vindkraft</p>
<p>Translations: Wind offshore energy</p> <p>Bosnia and Herzegovina: Energija vjetra u priobalju Bulgarian: Енергия от вятърно морски генератори Croatian: Energija vjetra u/na moru Czech: Větrná pobřežní energie Danish: Havvindmøller Dutch: Wind op zee Esperanto: Venta energio ekstertera (surmara) Estonian: Avamere tuuleenergia Finnish: Merituulivoima French: Énergie éolienne en mer (offshore) German: Offshore-Windenergie Greek: Θαλάσσιο Αιολικό Πάρκο Hebrew: ים רוח אנרגיית Hungarian: (nyílt)Tengeri szélenergia</p>	<p>Italian: Energia eolica off-shore Icelandic: Vindorka á sjó Latvian: Jūras vēja enerģija Lithuanian: Vėjo energetika jūroje Montenegrin: Energija vjetra na moru Polish: Energia eólica no mar Portuguese: Energia eólica em terra Romanian: Energie eoliană maritimă Russian: Офшорная ветроэнергетика Slovakian: Veterná pobrežná energia Slovenian: Vetrna elektrarna na morju Serbian: Енергија ветра на мору Spanish: Energía eólica marina (offshore) Swedish: Offshore vindkraft</p>

BEST PRACTICE

Definition

In a general sense, best practice (also used good practice) is an approach that, through scientific evidence and practical experience, showing processes and outcomes, which are superior to those achieved by other means, and which are used as models and recommendations for others.

In order to speak about best practice, it is necessary to define the parameters, why and how an example can be a best one. E.g. in the context of waste prevention, the European Commission has given the following benchmarks:

“Practices have been selected to demonstrate excellent examples of informational, promotional and regulatory measures to stimulate the prevention of waste. They were selected in consideration of the following criteria:

- Targeted: Practices have a strong waste prevention focus, clearly distinct from other waste management strategies or broad environmental goals.
- Innovative: Practices use original or resourceful techniques for waste prevention.
- Replicable: Practices can be easily reproduced and are similarly relevant in regions across Europe.
- Representative: Practices originate from a wide range of countries, operate at national, regional and local level, and target a variety of waste streams.
- Effective: Practices have clearly defined objectives and measurable results.

Best practice in the context of renewable energy development and landscape quality can be defined as the process and outcome of the production of renewable energy with minimal negative impact on people and at all stages of its life cycle (including planning, and the extraction, manufacturing, transport, and construction of the site, its operation and decommissioning). Furthermore, they have to be compatible with the landscape (as well with its character), and preventing or minimizing potential negative impacts on people and ecosystems.

In the COST action RELY best practice of renewable energy development is understood with respect to the elements underpinning landscape quality.

Related terms

Ecological engineering, Energy-conscious design, Environmental Impact Assessment

Keywords

Achievement, Evidence, Landscape compatible, Model case, Smart practice experience



Figure 30a. The ‘Floating’ solar power plant in Kagoshima Bay, Japan can be considered as a good example for saving space. The panels over water have a cooler temperature which makes them more efficient. Finally the blue colour of the panels matches with the blue of the water, hence the panels do not disturb aesthetically. (Photo: © KYOCERA Corporation)



Figure 30b. PV-Panels in parallel to the airstrip of Athens Airport. This can be considered as best practice as the installation respect at best the already given rectangular layout of infrastructure and agriculture. (Photos: Alexandra Kruse 2017)

Source

Definition developed by COST RELY Action.

http37: <http://ec.europa.eu/environment/waste/prevention/practices.htm>

Translations

Bosnia and Herzegovina: Najbolje prakse

Bulgarian: Най-добри практики

Croatian: Najbolja Praksa

Czech: Nejlepší praxe / osvědčená praxe

Danish: Bedste praksis

Dutch: Best practice

Esperanto: Plej bona praktiko

Estonian: Hea praktika näited

Finnish: Hyvät käytännöt

French: Bonne pratique, meilleur exemple

German: Leuchttumprojekt (we use the EN term)

Greek: Βέλτιστες Πρακτικές

Hebrew: פרקטיקות מיטביות

Hungarian: Jó gyakorlat

Italian: Buona pratica

Icelandic: Bestu starfsvenjur

Latvian: Labā prakse

Lithuanian: Geroji/geriausia praktika

Montenegrin: Primjeri najbolje prakse

Polish: Najlepsze praktyki

Portuguese: Boas práticas

Romanian: Bună practică

Russian: Лучшая практика, Лучший пример

Slovakian: Osvedčené postupy

Slovenian: Primeri dobre prakse

Serbian: Najbolje prakse

Spanish: Buenas prácticas

Swedish: Best practice

CULTURAL MAPPING

Definition

It is exploration of the complexity of local meanings of place through engagement with people and artistic practices, often combined with other sources of data. Aims at identifying local cultural resources supported by the communities, including landscape and cultural heritage. Usually forming a crucial part of the cultural planning process and has been recognized by UNESCO as a crucial tool and technique in preserving the world's intangible and tangible cultural assets. It encompasses a wide range of techniques and activities from community-based participatory data collection and management to sophisticated mapping using GIS (Geographic Information Systems).

In the context of COST RELY, cultural mapping might be considered during planning processes for renewable energy facilities.

Related terms

Cultural planning

Keywords

Cultural diversity, Cultural landscape mapping, Cultural resource mapping, GIS, participation



Figure 31a. Categories of the cultural resources
(Source: <http39>)

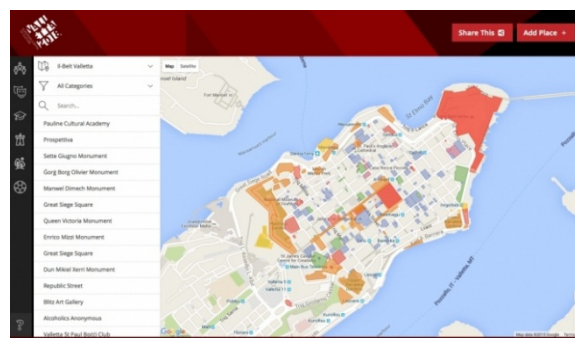


Figure 31b. Example of cultural mapping in Valletta, Malta (Source: <http38>)



Figure 31c. Álagablettur (FI) at the gate of Sturly-Reykir farm. Proposals for straightening the road were not implemented due to tales about “hidden people”, passed on through the generations, living on the area which would be affected (Photo: Laura Puolamäki 2012)

Sources

<http39>: <http://www.unescobkk.org/culture/tools-and-resources/tools-for-safeguarding-culture/culturalmapping/>

Translations

Bosnia and Herzegovina: Mapiranje kulturnih potencijala Bulgarian: Набелязване на карти за културни забележителности Croatian: Mapiranje kulturnih sadržaja Czech: Kulturní mapování Danish: Kultural kortlægning Dutch: Culturele kartering Esperanto: Mapado de kulturo Estonian: Kultuuriväärtuste kaardistamine Finnish: Kulttuurikartoitus French: Cartographie culturelle German: Erfassung kultureller Werte Greek: Πολιτισμική χαρτογράφηση Hebrew: מיפוי תרבותי Hungarian: Kulturális térképezés	Italian: Mappatura culturale Icelandic: Kortlagning menningarverðmæta Latvian: Kultūrvides kartēšana Lithuanian: Kultūrinis kartografavimas Montenegrin: Mapiranje kulturnih vrijednosti Polish: Mapowanie kultury Portuguese: Mapeamento cultural Romanian: Cartare culturală Russian: культурная картография Slovakian: Kultúrne mapovanie Slovenian: Identifikacija kulturnih potencialov z udeležbo prebivalcev Serbian: Мапирање култура Spanish: Cartografía cultural Swedish: Kulturell kartläggning
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CULTURAL PLANNING

Definition

It is strategic and iterative planning process of a locality, based on wide participation and cross-sectoral and building on the definition of culture as a way of life. Aims at collaborative and culturally sensitive planning, sustainable use and development of cultural resources and empowerment of local communities.

In comparison with the term cultural mapping, cultural planning is a public process in which representatives of a community undertake a comprehensive community assessment and create a plan of the cultural assets existing in their locality. Cultural planning is a process of inclusive community consultation and decision-making that helps local governments to identify cultural resources and to think strategically about how these resources can help a community to achieve its civic goals. In addition, it is a strategic approach that integrates the community's cultural resources into a wide range of local government planning activities
httpxx – add to literature.

Related terms

Cultural mapping

Keywords

Creative cities, Cultural resources planning, Urban planning

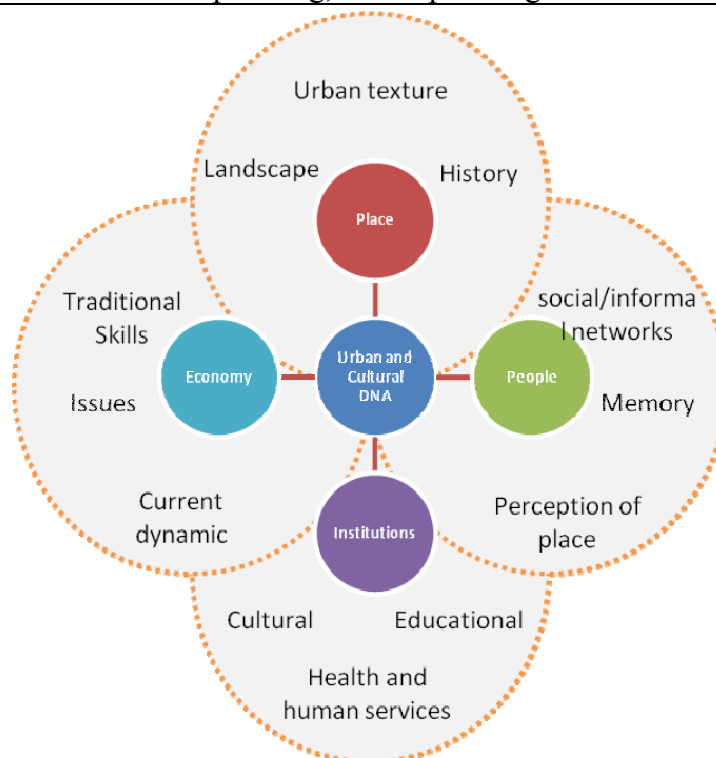


Figure 32. The Elements to consider during cultural planning (Source: http40)

Sources

Go, F., Lemmetyinen, A., Hakala, U. 2015: Harnessing place branding through cultural entrepreneurship. Palgrave Macmillan UK, London.

http41: https://www.creativecity.ca/database/files/library/cultural_planning_toolkit.pdf

Translations Bosnia and Herzegovina: Planiranje kulturnih potencijala Bulgarian: Планиране на културни забележителности Croatian: Planiranje kulturnih sadržaja Czech: Kulturní plánování Danish: Kultural planlægning Dutch: Culturele planologie Esperanto: Kultura planado Estonian: Kultuuriväärtuste kasutuse ja kaitse planeerimine Finnish: Kulttuurisuunnittelu French: Planification culturelle German: Planung unter Berücksichtigung kultureller Werte Greek: Πολιτισμικός σχεδιασμός Hebrew: תכנון מוטה תרבות	Hungarian: Kulturális tervezés Italian: Pianificazione culturale Icelandic: Skipulag með tilliti til menningarverðmæta Latvian: Kultūrvides plānošana Lithuanian: Kultūrinis planavimas Montenegrin: Planiranje u kulturi Polish: Planowanie kulturowe Portuguese: Planeamento cultural Romanian: Planificare culturală Russian: Культурное планирование Slovakian: Kultúrne plánovanie Slovenian: Participativno načrtovanje s poudarkom na kulturnih potencialih Serbian: Планирање култура Spanish: Planificación cultural Swedish: Kulturell planering
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ECOLOGICAL ENGINEERING

Definition

It is the design of sustainable ecosystems that integrate society with its natural environment for the mutual benefit of humans and nature. It is a recent branch of engineering that has developed with two goals:

1. The restoration of ecosystems that have been significantly disturbed by human activities (e.g. pollution); and
2. The development of new sustainable ecosystems that allow human activities.

The term has been introduced in connection with the restoration of rivers and other water bodies. In relation to Renewable Energy it can refer to shaping and forming the landscape to perform an engineering or RE function.

Related terms

Energy-conscious design

Keywords

Ecosystem based adaptation, Eco-technology, Ground-bioengineering, Environmental planning, Restoration

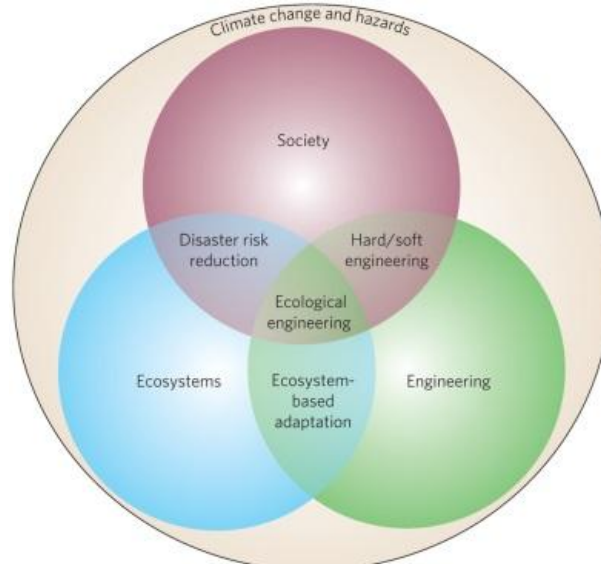


Figure 33. Ecological Engineering within the climate change and hazard framework
(Source: Cheong et al. 2013)

Sources

Mitsch, W. J. 2012: What is ecological engineering? Ecological Engineering 45: 5–12.

Mitsch, W.J., Jørgensen, S.E. 1989: Ecological Engineering: An Introduction to Ecotechnology. John Wiley and Sons, Hoboken, New Jersey.

<p>Translations</p> <p>Bosnia and Herzegovina: Ekosistemske tehnologije/Eko-inženjering</p> <p>Bulgarian: Еко-технология или еко-инженеринг (в смисъл на използване на ландшафта като платформа за инженерно строителство/възобновяеми източници за енергия)</p> <p>Croatian: Ekoloski inženjering</p> <p>Czech: Ekologické inženýrství</p> <p>Danish: No translation provided</p> <p>Dutch: No translation provided</p> <p>Esperanto: Ekteknologio aŭ ekoingénierio</p> <p>Estonian: Ökotehnoloogiad</p> <p>Finnish: Ekoteknologia</p> <p>French: Eco technologie, éco-ingénierie</p> <p>German: Umweltingeneering (as a mix of DE and EN)</p> <p>Greek: Οικοτεχνολογία</p> <p>Hebrew: הנדסה סביבתית</p>	<p>Hungarian: Ökológiai szemléletű tervezés /környezettudatos tervezés</p> <p>Italian: Tecnologia ecocompatibile</p> <p>Icelandic: Visttækni / vistverkfræði</p> <p>Latvian: Eko-tehnoloģija vai eko-inženierija</p> <p>Lithuanian: Eko-technologija; eko-inžinerija</p> <p>Montenegrin: Ekološki inženjering</p> <p>Polish: Ekotechnologia lub ekoinżynieria</p> <p>Portuguese: Engenharia Ecológica; ecotecnologia</p> <p>Romanian: Ecotehnologie sau ecoinginerie</p> <p>Russian: Эко-технология или эко-инженерия</p> <p>Slovakian: Ekologické inžinierstvo</p> <p>Slovenian: Okoljski inženiring</p> <p>Serbian: Екосистемске технологије</p> <p>Spanish: Eco-tecnología o Eco-ingeniería</p> <p>Swedish: Miljöteknik</p>
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ENERGY-CONSCIOUS DESIGN

Definition

Energy-conscious design and planning refers to the inclusion of energy, embodied-energy and energy efficiency in the planning and design of the built environment. It is relevant to design and planning at different scales, reaching from individual buildings to the regional scale.

The term refers to the ongoing transition towards a low-carbon energy future that is pursued through the increase of energy efficiency as well as the increase in renewable energy sources. Strategies for sustainable energy transition have implications for environmental design.

Energy-conscious design can be considered as part of ecological engineering but it also bridges the gap between ecological engineering (mainly in rural/natural surrounding/infrastructure context) and energy efficiency (mainly urban/man-made/building context).

Related terms

Ecological engineering

Keywords

Ecological design, Embodied-energy, Energy-efficient landscaping, Environmental design

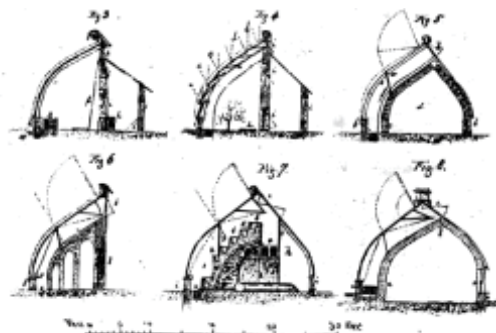


Figure 34a. Sir John Claudius Loudon's designs have been fundamental in the typological and technological definition of greenhouses. His famous "ridge and furrow" roof design is a zigzag glass construction able to maximize the access of sunlight and therefore heat, particularly in the early morning and late evening, when the sun was low in the sky. (Source: <http42>)



Figure 34b. Historic-Ecological Education Center Papenburg/Germany, built in 1988: Towards the North there are earth walls as energetic protection, towards the south a winter garden, which serves as semi-tropical greenhouse and as corridor between the accommodation units and common facilities. The bricks which store the temperature have been recycled. (Photo: <http43>)

Sources

De Waal, R., Stremke, S. 2014: Energy Transition: Missed Opportunities and Emerging Challenges for Landscape Planning and Designing. *Sustainability* 6(7): 4386–4415.

Hagan S. 2001: *Taking Shape. A new contract between architecture and nature.* Butterworth Heinenmann, Oxford.

Ingersoll, R. 2003: A postapocalyptic view of ecology and design. *Harvard Design Magazine*, Fall18.

Kallipoliti, L. 2010: "No more Schisms". *EcoRedux. Design Remedies for an Ailing Planet* 80(6): 14–24.

Ryn, S. V. D., Cowan, S. 1996: *Ecological design.* Island Press, Washington.

Stremke, S. 2017: Energy Transition at the Regional Scale: Building Sustainable Energy Landscapes. In: Ruby, I., Ruby, A. (eds.) *Infrastructure: Space*, Ruby Press, Berlin: pp. 217–28.

Stremke, S., Koh, J. 2011: Integration of Ecological and Thermodynamic Concepts in the Design of Sustainable Energy Landscapes. *Landscape Journal* 30(2): 194–213.

Translations	
Bosnia and Herzegovina: Energetski-svjesno planiranje	Italian: Progettazione energeticamente consapevole
Bulgarian: Дизайн по отношение на енергийни източници	Icelandic: Önnun með tilliti til orkusjónarmiða
Croatian: Projekt u skladu s očuvanjem energije	Latvian: Energo-effektīvs dizains
Czech: Energeticky uvědomělý design	Lithuanian: Eko-energetinis projektavimas
Danish: Energibevist design	Montenegrin: Dizajn koji uvažava pitanje energije
Dutch: Energiebewust ontwerp	Polish: Projektowanie świadome energetycznie
Esperanto: Konsciaj energoprojektoj	Portuguese: Design que tem em consideração questões energéticas
Estonian: Energiatähtlik disain	Romanian: Proiectare cu conștiința energiei
Finnish: Energiaa säästävä suunnittelu (closest match)	Russian: Эко-энергический дизайн
French: Conception éco-énergétique	Slovakian: Energeticky orientovaný dizajn
German: Niedrigenergiebauweise	Slovenian: Energetsko zavedno oblikovanje
Greek: Ενεργειακός Σχεδιασμός	Serbian: Енергетски одговоран дизајн
Hebrew: עיצוב אנרגטי	Spanish: Diseño ecoeficiente
Hungarian: Energiatudatos tervezés	Swedish: Energimedveten design

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

Definition

An Environmental Impact Assessment is a procedure evaluating the effects on the environment of an infrastructure project. The aim is to ensure that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation. Consultation with the public is a key feature of environmental assessment procedures.

Within the European Union, the Directive 2011/92/EU Environmental assessment regulates the EIA for individual projects, such as a dam, motorway, airport or factory, and the Directive 2001/42/EC (known as 'Strategic Environmental Assessment' – SEA Directive) regulates the assessment for public plans or programmes.

Landscape impacts are the impacts or effects on the 'landscape in its own right' (LI and IEMA 2013). Renewable energy landscape impacts use the methodologies of EIAs in the planning and assessment of proposed renewable energy production systems.

Related terms:

Strategic Environmental Assessment, Visual Impact Assessment

Keywords

Environmental factors, Environmental law, Renewable energy, Landscape impact, Sustainable development

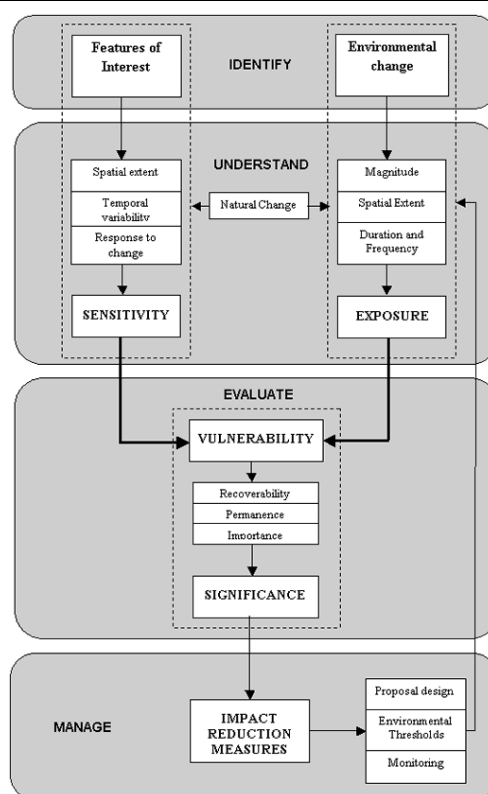


Figure 35. Procedure of Environmental Impact Assessment (Source: <http44>)

Sources

<http45: http://ec.europa.eu/environment/eia/home.htm>

LI and IEMA 2013: Guidelines on Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute and Institute of Environmental Management and Assessment. Routledge, London, New York.

Translations

Bosnia and Herzegovina: Procjena utjecaja na životnu sredinu/Procjena utjecaja na okoliš

Bulgarian: Оценка на въздействието върху околната среда

Croatian: Studija zaštite okoliša

Czech: Hodnocení vlivu na životní prostředí

Danish: Miljøvurdering

Dutch: Milieu-effect-rapportage

Esperanto: Takso de influo al medio

Estonian: Keskkonnamõju hindamine

Finnish: Ympäristövaikutusten arvionti

French: Étude de l'impact sur l'environnement / évaluation environnementale

German: Umweltverträglichkeitsprüfung

Greek: Ανάλυση Περιβαλλοντικής επιβάρυνσης

Hebrew: תסקיר השפעה על הסביבה

Hungarian: Környezeti hatásvizsgálat

Italian: Valutazione di impatto ambientale

Icelandic: Mat á umhverfisáhrifum / umhverfismat

Latvian: Ietekmes uz vidi novērtējums

Lithuanian: Poveikio aplinkai vertinimas

Montenegrin: Procjena uticaja na životnu sredinu

Polish: Ocena oddziaływania na środowisko

Portuguese: Avaliação de Impacte Ambiental

Romanian: Studiu de impact asupra mediului

Russian: Экологическая Оценка

Slovakian: Posudzovanie vplyvov na životné prostredie

Slovenian: Presoja vplivov na okolje

Serbian: Процена утицаја на животну средину

Spanish: Evaluación de impacto ambiental

Swedish: miljökonsekvensbedömning

LANDSCAPE ASSESSMENT

Definition

The purpose of landscape assessment in landscape planning is to support the identification of landscape values, development opportunities and management options. It is a broad term referring to various assessment types that may be classified by their objective as resource (opportunities for specific uses), capacity (constraints for specific uses) and other (not necessarily planning orientated) assessments (e.g. formal aesthetic, character, ecological assessments). Assessments can take account of quantitative and qualitative (descriptive or depictive) factors.

Related terms

Environmental Impact Assessments, Landscape capacity, Landscape character, Social Impact Assessment, Visual assessment

Keywords

Landscape quality, Renewable Energy systems, Landscape identity

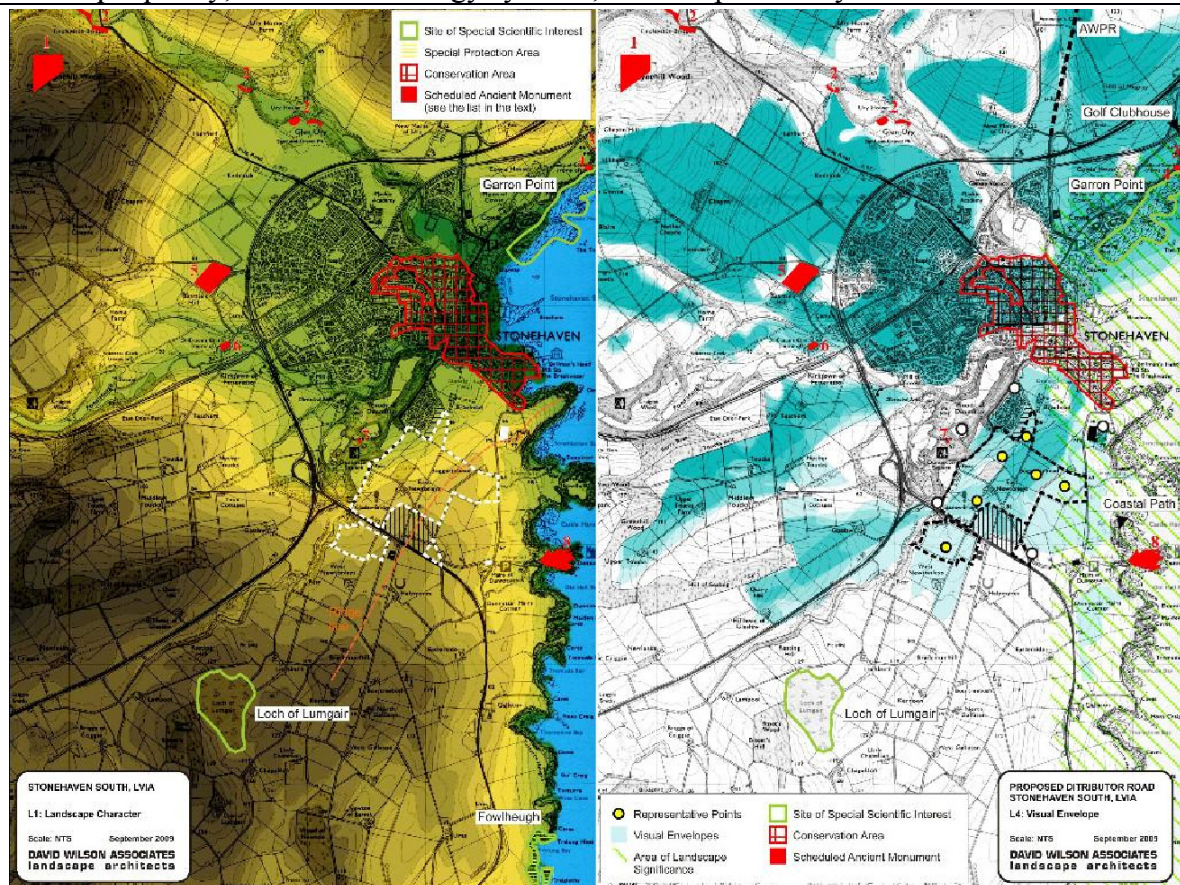


Figure 36. Maps showing the relationship between landscape and sites of special scientific interest, protection areas, ancient monuments, visual envelopes, etc.

(Source: Diagram from Stonehaven South LVIA, UK © David Wilson Associates)

Source

Definition developed by COST RELY Action.

Translations

Bosnia and Herzegovina: Procjena pejzaža/okoliša
 Bulgarian: Оценка на ландшафта
 Croatian: Studija utjecaja na krajolik
 Czech: Hodnocení krajiny
 Danish: Landskabsvurdering
 Dutch: Landschappelijke beoordeling
 Esperanto: Pritakso de pejzaĝo
 Estonian: Maastiku hindamine
 Finnish: Maisema-arviointi
 French: Evaluation du paysage
 German: Landschaftsbewertung
 Greek: Κατανόηση Τοπίου
 Hebrew: הערכה גופית
 Hungarian: Tájiértékelés

Italian: Valutazione paesaggistica
 Icelandic: Mat á landslagi / landslagsmat
 Latvian: Ainavas novērtējums
 Lithuanian: Kraštovaizdžio vertinimas
 Montenegrin: Procjena pejzaža
 Polish: Waloryzacja krajobrazu
 Portuguese: Avaliação paisagística
 Romanian: Evaluarea peisajului
 Russian: Оценка ландшафта
 Slovakian: Hodnotenie krajiny
 Slovenian: Vrednotenje krajine
 Serbian: Процена пејзажа
 Spanish: Evaluación del paisaje
 Swedish: Landskap bedömning

LANDSCAPE GOVERNANCE

Definition

Landscape governance is the process of goal-oriented formulation, coordination, management and decision-making about utilisation and protection of landscape involving governmental and non-governmental actors (general public, NGOs, private sector etc.).

The trend is of reducing responsibility of the state government for public spaces or common land, progressive decentralization of decision-making regarding landscape issues, transparency and citizen participation (bottom-up decision-making). This is consistent with Art. 6 para. D of the European Landscape Convention, “Each Party undertakes to define landscape quality objectives for the landscapes identified and assessed, after public consultation in accordance with Article 5.c.”

The European Landscape Convention provides a framework for landscape governance, implementing subsidiarity, defining principles and concepts, promoting citizen participation and co-operation at different administrative levels, without imposing specific rules and methodologies.

Related terms

Planning process, Public participation, Public participation processes and tools

Keywords

Decision-making, Landscape planning, Landscape policy, Landscape protection, Landscape quality

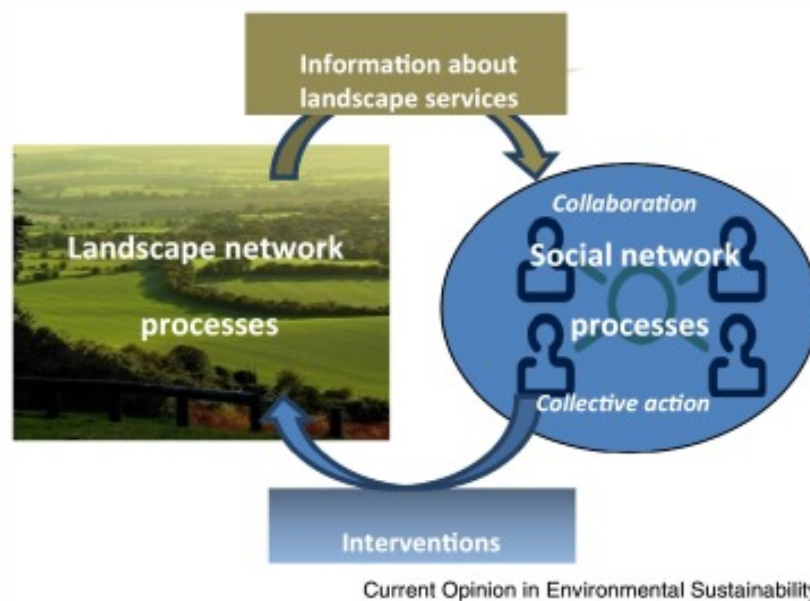


Figure 37. Landscape governance: interactions between natural and social-political aspects
(Source: Opdam et al. 2016)

Sources

- Buizer, M., Arts, B., Westerink, J. 2016: Landscape governance as policy integration “from below”: A case of displaced and contained political conflict in the Netherlands. *Environment and Planning. C, Government & Policy* 34(3): 448–462.
- Castree, N., Rogers, A., Kitchin, R. 2013: *A dictionary of human geography*. Oxford University Press, Oxford.
- Council of Europe. 2000: *European Landscape Convention*. Council of Europe, Florence. (also 9th Council of Europe Conference on the European Landscape Convention, 23–24 March 2017)
- Görg, C. 2007: Landscape governance. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 38(5): 954–966.
- Puolamäki, L. 2012: Individual views and shared landscape of folklore in Reykholtssdal, Iceland. *European Countryside* 2: 162–178.

Translations Bosnia and Herzegovina: Upravljanje zemljištem/ Upravljanje okolišem Bulgarian: Управление на ландшафта Croatian: Upravljanje krajolikom Czech: Správa krajiny Danish: No translation provided Dutch: Wijze van besturen van het landschap Esperanto: Regado pri pejzaĝoj Estonian: Maastiku valitsemine Finnish: Maiseman hallinta French: Gouvernance du paysage German: Landschaftsgouvernanz - but not very common Greek: Διοίκηση τοπίου Hebrew: משילות נופית Hungarian: Tájtervezés	Italian: Amministrazione del paesaggio Icelandic: Stjórnun landslags / landslagsstjórnun Latvian: Ainavas pārvaldība Lithuanian: Kraštovaizdžio reguliavimas Montenegrin: Upravljanje pejzažom Polish: Zarządzanie krajobrazem Portuguese: Regulação de paisagem, Governação da paisagem Romanian: Administrarea peisajului Russian: Ландшафтное управление Slovakian: Správa krajiny Slovenian: Upravljanje krajine Serbian: Управљање земљиштем / пејзажом Spanish: Gobernanza del paisaje Swedish: Landskapsstyrning
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LIFE CYCLE ANALYSIS (LCA)

Definition

Life Cycle Analysis (also called Life Cycle Assessment) is a technique to assess environmental impacts associated with all the stages of an asset's life, from cradle to grave, from raw material extraction, materials processing, manufacture, distribution, use and landscape context, repair and maintenance, and disposal or recycling.

LCA provides a wider consideration of environmental issues by:

- Compiling an inventory of relevant energy and material inputs, and environmental gains and losses;
- Evaluating the potential impacts associated with identified inputs and losses;
- Interpreting the results to help make a more informed decision.

Examples of relevance to COST RELY are: (i) the timescale required to balance the energy to produce photovoltaic systems and the energy saved through their use; (ii) assessing the carbon budgets of wind farms on peatlands.

Related terms

Sustainable renewable energy production, Energy conscious design, Environmental Impact Assessment

Keywords

Ecobalance, Amortization, Energy production, Energy recovery

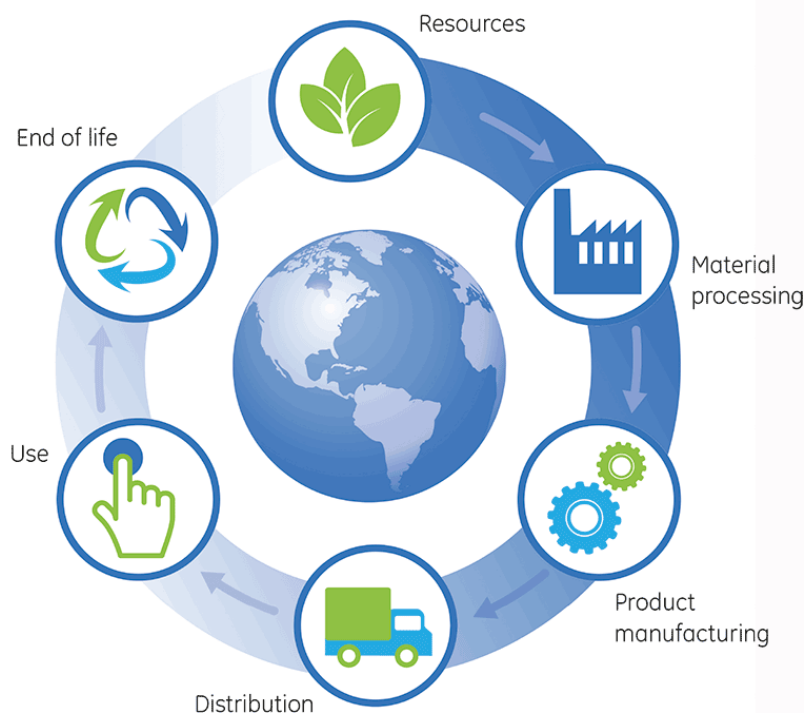


Figure 38. Product/asset life cycle (Source: GE Healthcare Life Sciences, <http://46>)

Sources

Bowe, S. 2010: A gate-to-gate life-cycle inventory of solid hardwood flooring in the Eastern US. Wood and Fiber Science, March 2010. Society of Wood Science and Technology, Madison.

Nayak, D.R., Miller, D.R., Nolan, A.J., Smith, P., Smith, J.U. 2010: Calculation carbon budgets of wind farm on Scottish peatlands. *Mires and Peat* 4: 1–23.

http47: <https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/aktuelle-fakten-zur-photovoltaik-in-deutschland.pdf>

Translations

Bosnia and Herzegovina: Analiza životnog ciklusa

Bulgarian: Анализ на жезнения цикъл

Croatian: Analiza zivotnog ciklusa

Czech: Analýza životního cyklu

Danish: Livscyklus analyse

Dutch: Kringloop

Esperanto: Analizo de ciklo de la vivo

Estonian: elutsüklianalüüs

Finnish: Elinkaarianalyysi

French: Analyse du cycle de (la) vie

German: Ökobilanz

Greek: Ανάλυση Κύκλου Ζωής

Hebrew: חיים מחזור הערכה

Hungarian: Életeciklus-elemzés

Italian: Analisi del ciclo di vita

Icelandic: Vistferilsgreining; lífsferilsgreining

Latvian: Dzīves cikla analīze

Lithuanian: Gyvavimo ciklo analizė

Montenegrin: Analiza životnog ciklusa

Polish: Analiza cyklu życia

Portuguese: Análise de ciclo de vida

Romanian: Analiza ciclului de viață

Russian: Анализ жизненного цикла

Slovakian: Analýza životného cyklu

Slovenian: Konflikt med rabami zemljišč

Serbian: Анализа животног циклуса

Spanish: Análisis de ciclos de vida

Swedish: Livscykelanalys

PLANNING PROCESS

Definition

A planning process, also called a planning procedure, is a legal framework by which a plan is developed from a start to its completion. It is defined in relevant national legislation. Such a process has a number of stages, depending on the type of plan (e.g. urban, environmental), scale (e.g. strategic, detailed), legal requirements for public participation (e.g. frequency and types of public consultation, public integration, types of stakeholders), assessment requirements (e.g. strategic environmental assessment), and stages at which administrative approval is required (e.g. ministerial or departmental).

Related terms

Public participation, Public participation procedure, Stakeholder, Strategic Environmental Assessment

Keywords

Legal framework

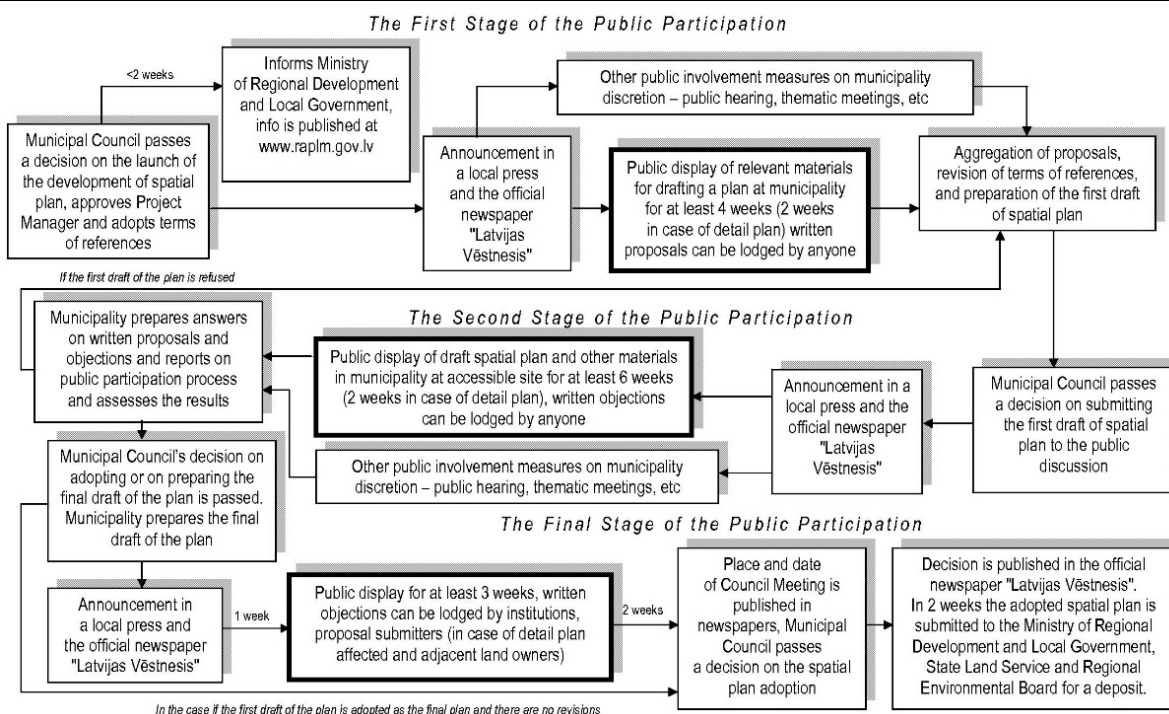


Figure 39. Scheme of the planning process in Latvia according to the COMMIN glossary
(Source: <http://48>)

Source

Definition developed by COST RELY Action.

Translations Bosnia and Herzegovina: Proces planiranja Bulgarian: Планирани процеси Croatian: Proces planiranja Czech: Plánovací proces Danish: /not used Dutch: Planproces Esperanto: Procezo de planado Estonian: Planeerimisprotsess Finnish: Suunnitteluprosessi French: Processus de planification German: Planungsprozess Greek: Ενεργειακός Σχεδιασμός Hebrew: תכנון תהליך Hungarian: Tervezési folyamat Italian: Processo progettuale	Icelandic: Skipulagsferli Latvian: Plānošanas process Lithuanian: Planavimo procesas Montenegrin: Proces planiranja Polish: Proces planowania Portuguese: Procedimentos do planeamento Romanian: Proces de planificare Russian: Процесс планирования Slovakian: Plánovací proces Slovenian: Načrtovalski proces Serbian: Процес планирања Spanish: Proceso de planificación/ordenación del territorio Swedish: Planeringsprocess
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PUBLIC PARTICIPATION

Definition

It is a process that directly engages the public in decision-making and gives full consideration to public input in making that decision. The level and nature of participation is usually described in terms of the openness of the process to the public, explained with respect to typologies such as eight-level scale of Arnstein (1969), Figure 39a, or five-level scale of the International Association of Public Participation (2017), Figure 39b.

Public: One or more natural or legal persons, and, in accordance with national legislation or practice, their associations, organisations or groups.

The public concerned: The public affected or likely to be affected by, or have an interest in, the environmental decision-making; for the purposes of this definition, non-governmental organizations promoting environmental protection and meeting any requirements under national law shall be deemed to have an interest.

Related terms

Landscape governance, Land use conflicts, Public participation process, Scenario techniques, Stakeholder

Keywords

Community involvement, Ladder of participation, Public involvement, Stakeholder involvement

Typology of eight level of citizen participation which contains rungs of "power"

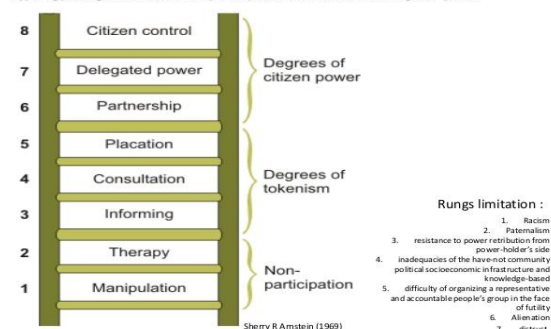


Figure 40a. Ladder of Participation
(Source: Arnstein 1969)

INCREASING IMPACT ON THE DECISION					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 40b. IPA2'S Public Participation Spectrum
(Source: <http49>)

Sources

Arnstein, S.R. 1969: A Ladder of Citizen Participation, JAIP 35(4): 216–224.

European Parliament and of the Council 2003: Public Participation Directive. European Parliament, Strasbourg. (<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0004>)

http50: www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation

http51: <https://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf>

http52: <https://www.iap2.org/?page=pillars>

Translations

Bosnia and Herzegovina: Građanska
participacija/Sudjelovanje javnosti

Bulgarian: Участие на обществеността

Croatian: Sudjelovanje javnosti

Czech: Účast veřejnosti

Danish: Borgerindragelser

Dutch: Publieks participatie

Esperanto: Publika partopreno

Estonian: Avalikkuse kaasamine

Finnish: Osallistamis

French: Participation publique

German: Bürgerbeteiligung

Greek: Διαδικασία δημόσιας διαβούλευσης

Hebrew: ציבור שיתוף הליך

Hungarian: Közösségi részvétel

Italian: Partecipazione pubblica

Icelandic: þátttaka almennings/ opinber þátttaka

Latvian: Sabiedrības līdzdalības

Lithuanian: Visuomenės dalyvavimo

Montenegrin: Učešće javnosti

Polish: Partycypacji społecznej

Portuguese: Participação pública

Romanian: Participare publică

Russian: Участие общественности

Slovakian: Účast' verejnosti

Slovenian: Sodelovanje javnosti

Serbian: Учесће јавности

Spanish: Participación pública

Swedish: Allmänhetens deltagande

PUBLIC PARTICIPATION PROCESS

Definition

Public participation process is a cycle or iterative process for stakeholders' engagement in decision-making. It usually comprises several phases which can be repeated: (i) a contextual (social and territorial) appraisal; (ii) participatory situation analysis; (iii) discussion and development of action plans (alternative or future plans). These phases can involve one or more stakeholder groups (generally as collective actions but possibly as individuals), operating in parallel or consecutively.

The following techniques can be used to facilitate public participation: sociograms (social maps), discussion groups, SWOT analysis, semi-structured interviews, life stories, participatory mapping and visualisation, future scenario development, and participation stairway.

Related terms

Landscape governance, Land use conflict, Planning process, Public participation, Scenario technique, Stakeholder

Keywords

Public consultation process, Public engagement process

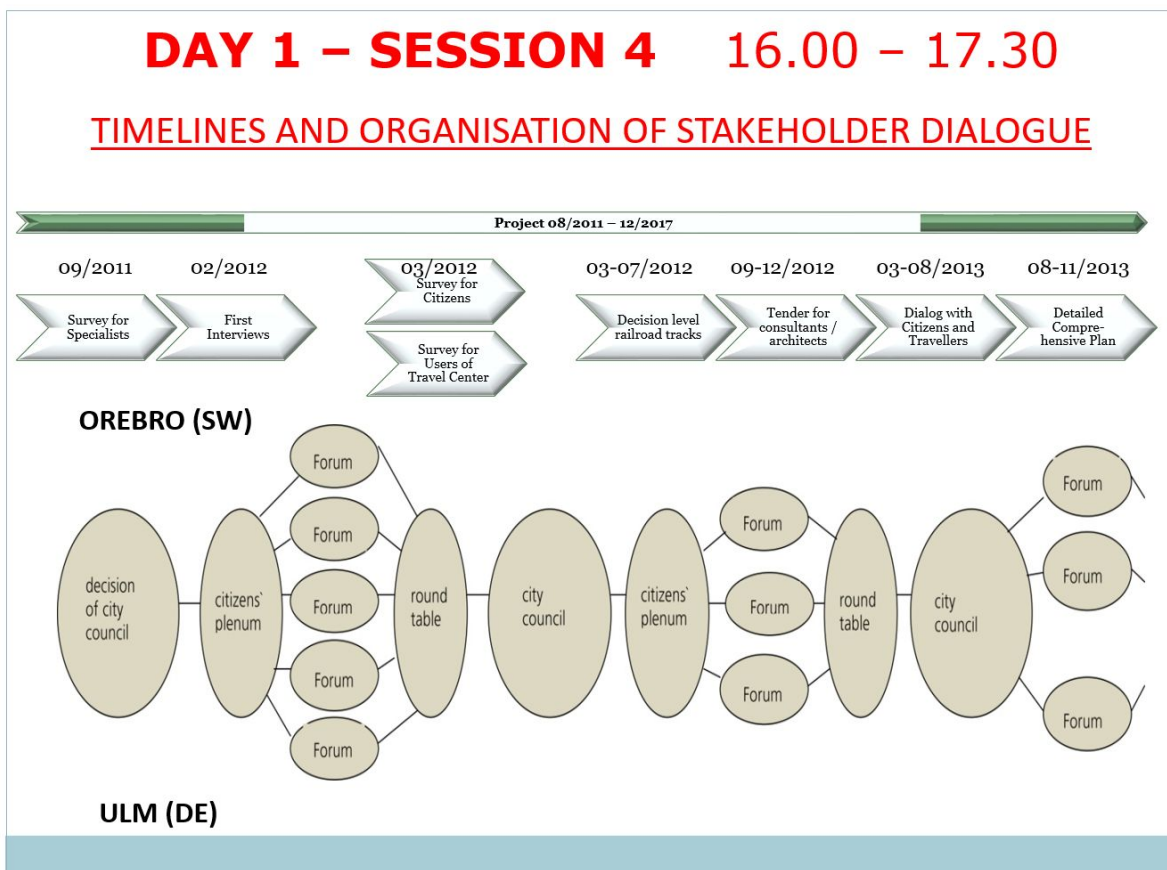


Figure 41a. Stakeholder dialog, including different steps and means with timeline
(Source: COMUS – 1st Stakeholder Workshop in Regensburg/Germany, presented by Philip Stein 2015)



Figure 41b. Often public participation is restricted to one/several public presentation of plans. Public hearing in Heiligenblut (Austria) during the World Heritage nomination process of the Großglockner High Alpine road. (Photo: Alexandra Kruse 2016)



Young people voting on benefits associated with different land uses in Aboyne, Aberdeenshire



Identifying benefits from the land, annotating aerial photographs, Aboyne, June

Figure 41c. Public participation should be more active and shall start early, like in this example from the James Hutton Institute (UK): Identifying benefits from the land, annotating aerial photographs, Aboyne, Aberdeenshire/UK (Photo: David Miller)

Figure 41d. (on your left) Participation uses different technical means – with respect to the (envisaged) audience. Young people voting on benefits associated with different land users in Aboyne, Aberdeenshire/UK. (Photo: David Miller)

Sources

Hewitt, R., Hernandez-Jimenez, V., Zazo-Moratalla, A., Ocón-Martín, B., Román-Bermejo, L., Encinas-Escribano, M. 2017: Participatory Modelling for Resilient Futures, Action for Managing Our Environment from the Bottom-Up. Developments in Environmental Modelling (series editor Brian D. Fath), Volume 30. Elsevier, Amsterdam.

Translations

Bosnia and Herzegovina: Proces građanske participacije/Sudjelovanje javnosti
 Bulgarian: Процес на участие на обществото
 Croatian: Sudjelovanje Javnosti
 Czech: Proces zapojení veřejnosti
 Danish: Borgerindragelsesprocess
 Dutch: Publieks participatie
 Esperanto: Procezo de publika partopreno
 Estonian: Avalikkuse kaasamine
 Finnish: Osallistamisprosessi
 French: Processus de participation publique
 German: Öffentlichkeitsbeteiligung
 Greek: Διαδικασία δημόσιας διαβούλευσης
 Hebrew: ציבור שיתוף הליך
 Hungarian: Közösségi részvétel

Italian: Processo di partecipazione pubblica
 Icelandic: Báttaka almennings
 Latvian: Sabiedrības līdzdalības process
 Lithuanian: Visuomenės dalyvavimo procesas
 Montenegrin: Proces učešća javnosti
 Polish: Proces partycypacji społecznej
 Portuguese: Processo de participação pública
 Romanian: Proces de participare publică
 Russian: Процесс участия общества
 Slovakian: Proces účasti verejnosti
 Slovenian: Postopek sodelovanja javnosti
 Serbian: Партиципација јавности
 Spanish: Proceso de participación pública
 Swedish: Allmänhetens deltagande

RENEWABLE ENERGY POLICY DOCUMENTS

Definition

Policy documents on local, regional, national and transnational level referring to the use of renewable energy are the following major policies on EU level:

- Energy 2020 A strategy for competitive, sustainable and secure energy,
- Renewable Energy Directive (2009/28/EC), and
- Directive to reduce indirect land use change for biofuels and bio liquids (EU 2015/1513).

According to these policies, EU countries should together reach a binding target of 20% final energy consumption from renewable sources by 2020. In order to do so they have committed themselves to their own targets ranging from 10% in Malta to 49% in Sweden. Additionally, they are required to reach at least 10% of their transport fuel comes from renewable sources by 2020.

On the national level countries adopt national renewable energy strategies/operational programmes/action plans presenting their objectives and measures to implement to meet the targets. These plans include sectorial targets for electricity, heating and cooling, and transport; planned policy measures; the different mix of renewables technologies they expect to employ; and the planned use of cooperation mechanisms.

On the lower administrative levels, regions can adopt regional energy plans, and on the local level local communities can prepare local energy concept.

Local energy concept (LEC), called as well (local) sustainable energy plan, assesses opportunities and proposes solutions for the energy supply of the local community, taking into account the long-term development of the local community in various fields and existing energy capacity. Local energy concepts are designed to raise awareness of energy consumers, to prepare measures in the field of energy efficiency, and to introduce new energy solutions. They include an analysis of the current situation in the field of energy use and energy supply. LEC examines the possibility of using local renewable energy sources, which increase the security of supply of heat and electricity in the local community. The proposed projects simultaneously bring the reduction of emissions and environmental pollution. Local energy concept includes an Action Plan (where projects are economically evaluated) and a schedule.

Related terms

Planning process

Keywords

Policy making, Sustainable energy, Renewable energy, Local authority

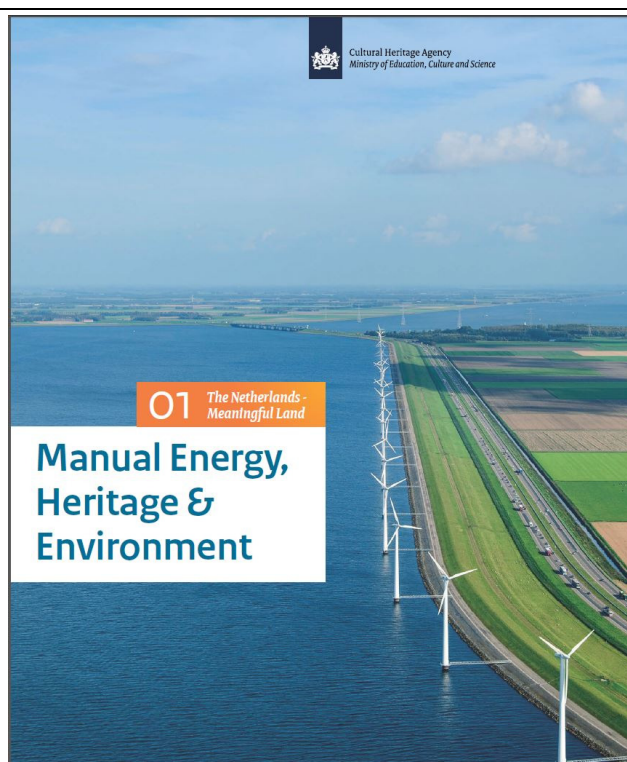


Figure 42. Cover of National policy statement for renewable energy, heritage and environment by the Dutch Agency for Cultural Heritage (Source: [http53](http://53))

Sources

European Commission 2009: Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources. European Commission, Brussels.

European Commission 2010: Energy 2020 A strategy for competitive, sustainable and secure energy. European Commission, Brussels.

[http54: http://www.lea-ptuj.si/en/services/local-energy-concept/](http://www.lea-ptuj.si/en/services/local-energy-concept/)

Translations

Bosnia and Herzegovina: Zakonska regulativa u vezi obnovljivih izvora energije

Bulgarian: Политически документ за възобновяема енергия

Croatian: Regulativa iz obnovljivih izvora energije

Czech: Politické dokumenty týkající se obnovitelných zdrojů

Danish: Vedvarende energi politisk document

Dutch: Beleidsdocumenten

Esperanto: Dokumentoj politikaj pri produktado de renovigebla energio

Estonian: Taastuvenergia-alane seadusandlus

Finnish: Uusiutuvan energian politiikka-aineistot

French: Documents politiques sur l'Énergie renouvelable

German: Positionspapier zu Erneuerbaren Energien

Greek: Κείμενα πολιτικής για τις ΑΠΕ

Hebrew: מחדשות אנרגיות על מדיניות מסמכי

Hungarian: Megújulóenergia-irányelv dokumentumai

Italian: Documenti di indirizzo per l'energia rinnovabile

Icelandic: Stefnuskjöl um endurnýjanlega orku

Latvian: Atjaunīgās enerģijas (AE) politikas dokumenti

Lithuanian: Atsinaujinančios energetikos teisės aktai

Montenegrin: Zakonska regulativa o obnovljivim izvorima energije

Polish: Dokumenty polityki źródeł odnawialnych

Portuguese: Documentos de orientação política para Energia Renovável

Romanian: Documente politice privind energia regenerabilă

Russian: Документы по политике использования возобновляемых источников энергии

Slovakian: Politické dokumenty o obnoviteľných zdrojoch energie

Slovenian: Dokumenti politik za obnovljive vire energije

Serbian: Законска регулатива у вези обновљивих извора енергије

Spanish: Normativa sobre energías renovables

Swedish: energipolicy

SCENARIO TECHNIQUES

Definition

A scenario as a plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key relationships and driving forces. Scenarios enable: (i) the envisioning of future pathways and accounting for critical uncertainties; (ii) addressing real-world questions for which the future is subject to human actions and choices and not preordained. The objective is to encourage people to consider and discuss alternative futures. The focus is on the internal consistency of the scenario storyline rather than on their likelihood of coming true. In COST RELY, pathways and choices relate to the development of renewable energy systems in different landscape settings.

A range of techniques may be employed in development of scenarios. Two broad approaches are defined:

1. Non-participatory: Non-participatory scenario development usually involves a model with some kind of exploratory or predictive capacity which is projected forward to a future date, usually after calibration against historical (observed) data. The output of various climate models under Intergovernmental Panel on Climate Change (IPCC) scenarios is a good example of this technique. It is non-participatory in the sense that it uses only data collected by researchers, and participatory processes are not formally used for information gathering or scenario construction.

2. Participatory: Participatory scenario development differs from the above in that scenarios are constructed by, or based on information supplied by stakeholders engaged in some kind of participatory process. For example, the European Environment Agency PRELUDE project (2004-2005) engaged stakeholders from multiple backgrounds from across Europe to create five scenarios for a Europe affected by changing patterns of land use, climate change, agriculture and demographics. In Spain, local stakeholders developed four “Ecofuture” scenarios for the threatened Doñana natural area in the year 2035 under an ecosystem services approach. They then illustrated the scenarios on posters using a range of materials, like press and magazine cuttings. A Follow-up project mapped these scenarios inside a land use model.

Related terms

Landscape Governance, Public participation, Planning process, Public participation process

Keywords

Participatory scenario planning, Future scenarios, Scenario modelling, Strategy formulation

Scenario Framework with Land Use Change storylines

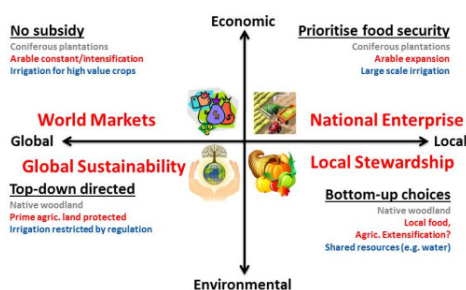


Figure 43a. Scenarios of alternative development pathways for land use. Developed from the UKCIP/Foresight socioeconomic scenarios (Source: Brown and Castellazzi 2014)

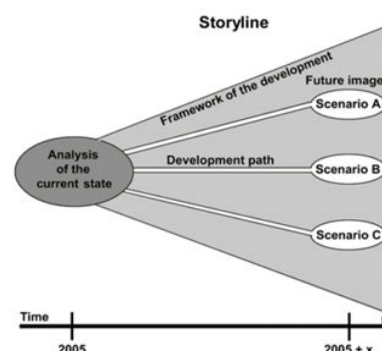


Figure 43b. Scenario technique (Source: Schroth 2010)



Figure 43c. Workshop participants in Doñana, Spain locating hypothesized land use change under EcoFuture scenario “Trademark Doñana” (Photo: Verónica Hernández Jiménez 2012)

Sources

Hewitt, R., Van Delden, H., Escobar, F. 2014: Participatory land use modelling, pathways to an integrated approach. *Environmental Modelling & Software* 52: 149–165.

Nakicenovic, N., Swart, R. 2000: Emissions Scenarios 2000 - Special report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge.

Palomo, I., Martín-López, B., López-Santiago, C., Montes, C. 2011: Participatory scenario planning for protected areas management under the ecosystem services framework: the Doñana social-ecological system in southwestern Spain. *Ecology and Society* 16(1): 23.

Raskin, P., Monks, F., Ribeiro, T., van Vuuren, D., Zurek, M. 2005: Global scenarios in historical perspective, Millennium Ecosystem Assessment. UNEP, New York.

Ringland, G. 1998: Scenario Planning. John Wiley & Sons, Chichester.

Volkery, A., Ribeiro, T., Henrichs, T., Hoogeveen, Y. 2008: Your vision or my model? Lessons from participatory land use scenario development on a European scale. *Systemic Practice and Action Research* 21(6): 459–477.

Translations

Bosnia and Herzegovina: Tehnike scenarija	Italian: Tecnica di scenario
Bulgarian: Техника на сценария	Icelandic: Sviðsmyndagreining
Croatian: Scenariji	Latvian: Scenāriju tehnika
Czech: Technika scénáře	Lithuanian: Scenarijai
Danish: Scenarioteknik	Montenegrin: Scenarioteknika
Dutch: Scenariotechnieken	Polish: Technika scenariuszy
Esperanto: Tekniko de scenaro	Portuguese: Metodologia de cenário
Estonian: Stsenaarium / tulevikuväljavaade	Romanian: Tehnica scenariului
Finnish: Skenaariotekniikka	Russian: Технический сценарий
French: Scénario technique	Slovakian: Technika scénára
German: Szenario Methode	Slovenian: Orodja in tehnike sodelovanja javnosti
Greek: Σενάριο	Serbian: Технике сценарија
Hebrew: תרחיש מתודות	Spanish: Escenarios técnicos
Hungarian: Szenáriók technika	Swedish: Scenarioteknik

SOCIAL IMPACT ASSESSMENT (SIA)

Definition

It is a process of analysing, monitoring and managing the intended and unintended social consequences (either positive or negative) of planned interventions (policies, programmes, plans, projects) and/or any social change processes invoked by those interventions. Its primary purpose is to create a more sustainable and equitable biophysical and human environment.

Related terms

Environmental Impact Assessment, Landscape governance, Landscape assessment

Keywords

Interventions, Social consequences, Sustainability



Figure 44. Social Impact Assessment: Due to mining of lignite the medieval city of Most in Western-Bohemia was demolished in 1960s and a new city made of prefab houses was built (Photo: Stanislav Martinat 2013)

Source

Vanclay, F. 2003: International principles for social impact assessment. *Impact Assessment and Project Appraisal* 21(1): 5–12.

Translations

Bosnia and Herzegovina: Translation not provided
 Bulgarian: Оценка за социалното въздействие
 Croatian: Procjena utjecaja na društvo
 Czech: Hodnocení dopadu na společnost
 Danish: Social konsekvensanalyse
 Dutch: Sociale effectstudie (no Dutch instrument)
 Esperanto: Takso de socia efiko
 Estonian: Sotsiaalse mõjude hindamine
 Finnish: 'Sosiaalisten vaikutusten arviointi
 French: Etude de l'impact social
 German: Sozialverträglichkeitsprüfung
 Greek: Ανάλυση κοινωνικών επιπτώσεων
 Hebrew: ברתית השפעה הערכת
 Hungarian: Szociális hatás vizsgálata

Italian: Valutazione di impatto sociale
 Icelandic: Mat á samfélagsáhrifum
 Latvian: Sociālās ietekmes novērtējums
 Lithuanian: Socialinio poveikio vertinimas
 Montenegrin: Procjena socioloških uticaja
 Polish: Ocena wpływu społecznego
 Portuguese: Avaliação de Impacto Social
 Romanian: Evaluarea impactului social
 Russian: Оценка социального воздействия
 Slovakian: Posudzovanie sociálneho vplyvu
 Slovenian: Presoja vplivov na družbo
 Serbian: Процена социолошких утицаја
 Spanish: Evaluación del impacto social
 Swedish: Social konsekvensanalys

STAKEHOLDER

Definition

A stakeholder is an individual, a group of individuals, a company or an institution that has a stake in a plan, project or any other planning related matter. A stakeholder can be either public (e.g. planning department of the local community) or private (e.g. construction company). The stake can be defined according to the property (e.g. ownership of the land), spatial proximity (e.g. neighbouring parcel), development interest (e.g. investment companies), political interest or values and principles (e.g. engagement of NGO's in the planning process). Stakeholders are defined with the method of stakeholders' mapping.

Related terms

Planning process, Public participation, Public participation process

Keywords

Public participation, Policy making, Bottom-up decision making process



Figure 45. Example of the stakeholders' representation and their power in the local spatial development (Source: Marot 2010)

Source

Developed by COST RELY Action.

Translations

Bosnia and Herzegovina: Zainteresovane strane
Bulgarian: Заинтересовани страни
Croatian: Interesni sudionik
Czech: Podílník/účastník /zájmové strany
Danish: /not used
Dutch: Belanghebbende (ook Stakeholder)
Esperanto: Interesitaj partioj
Estonian: Asjaline
Finnish: Osallinen
French: Partie prenante
German: Interessenvertreter (we also use stakeholder)
Greek: Μέτοχοι
Hebrew: עניין בעל
Hungarian: Érintett

Italian: "Soggetto interessato" or Stakeholder
Icelandic: Hagsmunaaðili; haghafi
Latvian: Ieinteresētās puses
Lithuanian: Suinteresuotoji šalis
Montenegrin: Zainteresovana strana
Polish: interesariusz
Portuguese: Atores/ Stakeholders
Romanian: Actor
Russian: заинтересованная сторона
Slovakian: Zainteresovaná strana / subjekt
Slovenian: Deležnik
Serbian: Заинтересована страна
Spanish: Agentes sociales implicados
Swedish: Intressent/stakeholder

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

Definition

According to Organisation for Economic Co-operation and Development (OECD) Strategic Environmental Assessment (SEA) is defined as analytical and participatory approach to strategic decision-making that aims at integrating environmental considerations into policies, plans and programmes and evaluates the inter linkages with economic and social considerations. It involves stating objectives of the policies, plans and programmes (PPP), describing the baseline environment, predicting the likely environmental impacts of the PPP (and of alternatives), and proposing ways of mitigating these impacts. It is generally carried out by (or for) the PPP proponent, with consultation of other relevant agencies.

According to the EU directive on SEA, a SEA is mandatory for plans and programs which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive, or have been determined to require an assessment under the [Habitats](#) Directive.

Video introduction to EU SEA is available here:

http://ec.europa.eu/environment/temp/SEA_protocol_v5_ENG.mp4.

Related Terms

Environmental Impact Assessment, Landscape assessment

Keywords

Assessment, Landscape changes

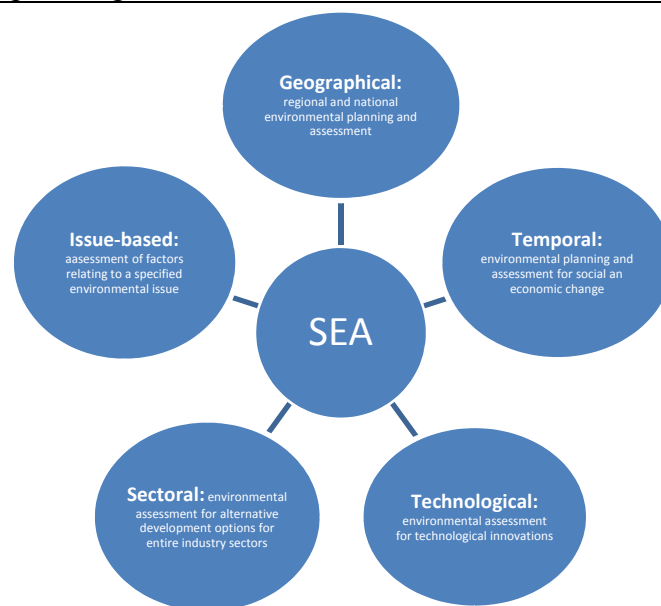


Figure 46. Strategic Environmental Assessment (Source: Buckley 1998)

Sources

Buckley, R. 1998: Strategic Environmental Assessment. In: Peter, A.L., Fittipaldi, J.J., Environmental Methods Review: Retooling Impact Assessment for the New Century. The Press Club, USA.

European Commission 2001: Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive). European Commission, Brussels.

http55: http://sba-int.ch/1274-Strategic_Environmental_Assessment

Thérivel, R. 1997: Strategic environmental assessment in Central Europe. Project Appraisal 12(3): 151–160.

Translations

Bosnia and Herzegovina: Strateška procjena uticaja na životnu sredinu/ Strateška procjena utjecaja na okoliš
 Bulgarian: Стратегическа оценка на околната среда
 Croatian: Strateška procjena utjecaja na okoliš
 Czech: Strategické environmentální hodnocení (Posuzování vlivů koncepcí na životní prostředí)
 Danish: Strategisk miljøvurdering
 Dutch: Strategische milieubeoordeling (nu plan-m.e.r.)
 Esperanto: Strategia takso de influo al medio
 Estonian: Strateegiline keskkonnamõjude hindamine
 Finnish: Strateginen ympäristövaikutusten arviointi
 French: Evaluation stratégique de l'environnement
 German: Strategische Umweltprüfung (SUP)
 Greek: Στρατηγική περιβαλλοντικής ανάλυσης
 Hebrew: הסביבה על להשפעה אסטרטגית תסקיר
 Hungarian: stratégiai környezetértékelés
 Italian: Valutazione ambientale strategica

Icelandic: umhverfismat áætlana
 Latvian: Stratēģiskais vides novērtējums
 Lithuanian: Strateginis poveikio aplinkai vertinimas
 Montenegrin: Strateška procjena uticaja na životnu sredinu
 Polish: Strategiczna ocena oddziaływania na środowisko
 Portuguese: Avaliação ambiental estratégica
 Romanian: Evaluarea impactului strategic
 Russian: Стратегическая Экологическая Оценка
 Slovakian: Strategické environmentálne hodnotenie
 Slovenian: Strateška presoja vplivov na okolje / celovita presoja vplivov na okolje
 Serbian: Стратешка процена утицаја на животну средину
 Spanish: Evaluación Ambiental Estratégica
 Swedish: Strategisk miljöbedömning

TERRITORIAL IMPACT ASSESSMENT (TIA)

Definition

It is an assessment approach, developed by several projects in the frame of the ESPON program. It aims at informing policy makers on the impacts of (EU) policies, e.g. Directive 2009/28/EC on the promotion of the use of energy from renewable sources, on different geographical areas ('territorial units'), comprising the assessment of environmental and spatial, economic, social and administrative impacts. It consists of four phases, namely screening, scoping, assessment and evaluation, and can be performed in either *ex-ante* or *ex-post* manner.

An on-line ESPON TIA tool combines the expert knowledge and judgements about the potential impact with a set of statistical data describing the characteristics of regions. Based on the different sensitivity of regions the expert judgments are translated into maps showing the territorial impact of EU policy on NUTS3 level. These maps can serve as starting point for further discussion of different impacts of a concrete EU policy on different regions. The tool is available here: <https://www.espon.eu/tools-maps/espon-tia-tool>

Related terms

Environmental Impact Assessment (EIA), Social Impact Assessment (SIA)

Keywords

EU directives, Policy making, Territorial approach

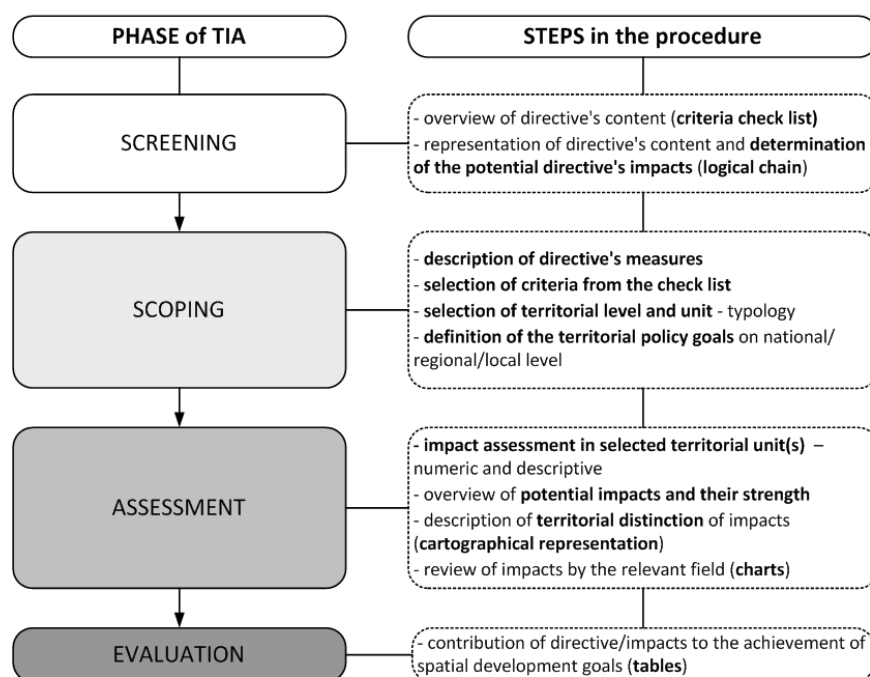


Figure 47. Territorial Impact Assessment procedure (Source: Golobič et al. 2015)

Sources

Fischer, T.B., et al. 2012: ESPON EATIA: ESPON and Territorial Impact Assessment. Final Report. ESPON, Luxembourg.

Golobič, M., Marot N., Kolarič, Š., Fischer, T.B. 2014: Applying territorial impact assessment in a multi-level policy-making context – the case of Slovenia. Impact Assessment and Project Appraisal 33(1): 43–56.

http56: <https://www.espon.eu/tools-maps/espon-tia-tool>

Translations	
<p>Bosnia and Herzegovina: Studija uticaja na teritoriju</p> <p>Bulgarian: Оценка на въздействието върху околната среда за територията</p> <p>Croatian: Studija utjecaja na teritorij</p> <p>Czech: Hodnocení dopadů na území</p> <p>Danish: /not used</p> <p>Dutch: Territoriale effectrapportage</p> <p>Esperanto: Takso de teritoriaj efikoj</p> <p>Estonian: Territoriaalse mõju hindamine</p> <p>Finnish: /not used</p> <p>French: Etude d'impact territorial</p> <p>German: Raumverträglichkeitsprüfung</p> <p>Greek: Περιφερική Ανάλυση Επιπτώσεων</p> <p>Hebrew: השטח פני על ההשפעה הערכת</p> <p>Hungarian: területi hatásvizsgálat (not in use)</p>	<p>Italian: Valutazione di impatto territoriale</p> <p>Icelandic: /not used</p> <p>Latvian: Teritoriālās ietekmes novērtējums</p> <p>Lithuanian: Teritorinio poveikio vertinimas</p> <p>Montenegrin: Teritorijalna procjena uticaja</p> <p>Polish: Ocena oddziaływania terytorialnego</p> <p>Portuguese: Avaliação de Impacto Territorial</p> <p>Romanian: Evaluarea impactului territorial</p> <p>Russian: Оценка воздействий территории</p> <p>Slovakian: Hodnotenie územného dosahu</p> <p>Slovenian: Presoja učinkov na prostor</p> <p>Serbian: Процена територијалног утицаја</p> <p>Spanish: Evaluación de impacto territorial</p> <p>Swedish: Territoriell konsekvensanalys</p>

VISUAL ASSESSMENT

Definition

Visual assessment (called also Visual Impact Assessment – VIA) is the process (including analysis) of taking account of the effects of certain types of development on the visual landscape, usually prior to implementation. The term Visual Impact Assessment was coined as part of Environmental Impact Assessment in the US National Environmental Policy Act of 1969.

In COST RELY, it concerns with how the visual characteristics of landscape are influenced by the development of renewable energy systems. The process identifies and evaluates these effects, and uses the data gathered to support informed decision making.

Related terms: Landscape assessment, Environmental Impact Assessment, Visual impact

Keywords

Visual effects, Visual amenity, Experience, Perception, Viewpoint analysis, Zones of visual influence



Figure48a. Model to give an impression of how a solar panel installation would look like – today an often used tool for a visual assessment (Source: <http57>)

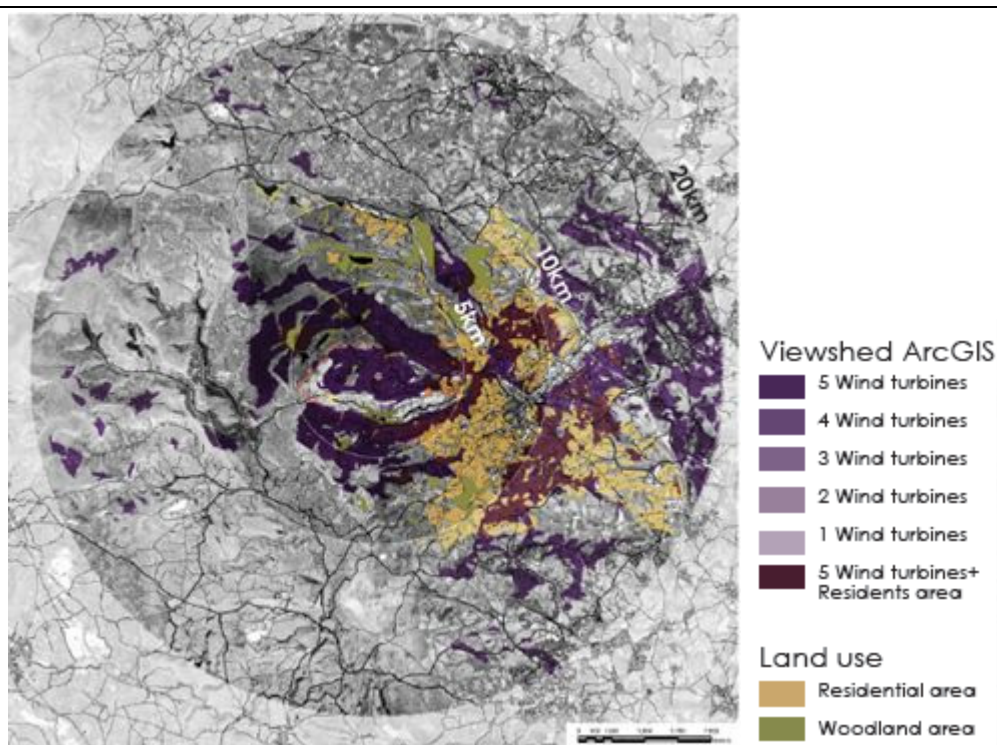


Figure 48b. Viewshed (or Zone of Theoretical Visibility) indicating the number of wind turbines in purple colours (the darker the more turbines are visible) overlaid with settlement area (yellow) and forest (green) (Source: University of Sheffield 2016)

Sources

Elaborated by the COST RELY Action members on the base of Landscape Institute, Institute of Environmental Management 2013: Guidelines for Landscape and Visual Impact Assessment 3rd edition- consultation draft". Landscape Institute, London.
 http58: <http://www.saratogaassociates.com/visual-assessment/visual-assessment/16452900>
 http59: www.macaulay.ac.uk/ccw/task-three/via.html#ref
 http60: <https://www.epa.gov/laws-regulations/summary-national-environmental-policy-act> US United Environmental Agency 1969: Summary of the National Environmental Policy Act, 42 U.S.C. §4321 et seq. United States Environmental Agency, Washington DC.

Translations

Bosnia and Herzegovina: Vizuelna procjena/ Procjena vizuelnih efekata
 Bulgarian: Оценка на устойчивостта
 Croatian: Procjena vizualnog utjecaja
 Czech: Vizuální hodnocení
 Danish: visualisering
 Dutch: visuele beoordeling
 Esperanto: Vida takso
 Estonian: visuaalne hindamine
 Finnish: Visuaalinen arviointi
 French: Evaluation de la visibilité
 German: Landschaftsbildbewertung
 Greek: Οπτικής ανάλυση
 Hebrew: חזותית השפעה הערכת
 Hungarian: vizuális értékelés

Italian: Valutazione visiva
 Icelandic: sjónrænt mat
 Latvian: Teritoriālās ietekmes novērtējums
 Lithuanian: Vizuālais novertėjums
 Montenegrin: Vizuelna procjena
 Polish: Vizualna procjena
 Portuguese: Ocena wizualna
 Romanian: evaluare vizuală
 Russian: визуальная оценка
 Slovakian: Vizuálne hodnotenie
 Slovenian: vizualna presoja
 Serbian: Визуелна процена
 Spanish: Evaluación de la visibilidad
 Swedish: visuellt bedömning

References

- Arnstein, S.R. 1969: A Ladder of Citizen Participation, *JAIP* 35(4): 216–224.
- Bastian, O., Grunewald, K., Syrbe, R-U., Walz, U., Wende, W. 2015: Landscape services: the concept and its practical relevance. *Landscape Ecology* 29(9):1463–1479.
- Bevk, T. 2015: The use of automated classification for landscape typology in the case of regional distribution of landscape types in Slovenia: Master thesis. Biotechnical Faculty, University of Ljubljana, Ljubljana.
- Bolliger, J., Kienast, F. 2010: Landscape Functions in a Changing Environment. *Landscape Online* 21: 1–5.
- Botelho, A., Pinto, L. M., Lourenço-Gomes, L., Valente, M., Sousa, S. 2016: Social sustainability of renewable energy sources in electricity production: An application of the contingent valuation method. *Sustainable Cities and Society* 26: 429–437.
- Bowe, S. 2010: A gate-to-gate life-cycle inventory of solid hardwood flooring in the Eastern US. *Wood and Fiber Science*. Society of Wood Science and Technology, Madison.
- Brown, I., Castellazzi, M. 2014: Scenario analysis for regional decision-making on sustainable multifunctional land uses. *Regional Environmental Change* 14(4): 1357–1371. (Figure 43a)
- Buckley, R. 1998: Strategic Environmental Assessment. In: Peter, A.L., Fittipaldi, J.J. (eds.) *Environmental Methods Review: Retooling Impact Assessment for the New Century*. The Press Club, USA.
- Buizer, M., Arts, B., Westerink, J. 2016: Landscape governance as policy integration “from below”: A case of displaced and contained political conflict in the Netherlands. *Environment and Planning. C, Government & Policy* 34(3): 448–462.
- Castree, N., Rogers, A., Kitchin, R. 2013: A dictionary of human geography. Oxford University Press, Oxford.
- Cheong, S. M., Silliman, B., Wong, P. P., Van Wesenbeeck, B., Kim, C. K., Guannel, G. 2013: Coastal adaptation with ecological engineering. *Nature Climate Change* 3(9): 787–791. (Figure 33)
- Council of Europe. 2000: European Landscape Convention. Council of Europe, Florence.
- Countryside Agency and Scottish Natural Heritage 2002: Landscape character assessment guidance for England and Scotland, Cheltenham, Countryside Agency; Edinburgh, Scottish Natural Heritage, Paragraph 7.8; Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity.
- Daniel, T.C. 2001: Whither scenic beauty? Visual landscape quality assessment in the 21st century. *Landscape and Urban Planning* 54: 267–281.
- de Andrés-Ruiz, C., Iranzo-García, E., Espejo-Marín, C. 2015: Solar thermoelectric power landscapes in Spain: A new kind of renewable energy landscape? In: Frolova, M., Prados, M.-J., Nadaï, A. (eds.) *Renewable Energies and European Landscapes: Lessons from Southern European cases*. Springer, New York, London, pp. 237–254.
- De Waal, R., Stremke, S. 2014: Energy Transition: Missed Opportunities and Emerging Challenges for Landscape Planning and Designing. *Sustainability* 6(7): 4386–4415.
- Environmental Agency 1969: Summary of the National Environmental Policy Act, 42 U.S.C. §4321 et seq. United States Environmental Agency, Washington DC.
- Eurelectric 2011: Hydro in Europe: Powering Renewables. Union of the Electricity Industry, Brussels, pp. 66.
- European Commission 2001: Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive). European Commission, Brussels.
- European Commission 2009: Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources. European Commission, Brussels.
- European Commission 2010: Energy 2020 A strategy for competitive, sustainable and secure energy. European Commission, Brussels.
- European Parliament and of the Council 2003: Public Participation Directive. European Parliament, Strasbourg. (<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0004>)
- Evans, A., Strezov, V., Evans, T.J. 2009: Assessment of sustainability indicators for renewable energy technologies. *Renewable and Sustainable Energy Reviews* 19: 1082–1088.
- Fairclough, G. 2010: Complexity and contingency: classifying the influence of agriculture on European landscapes. In: Pungetti, G., Kruse, A. (eds.): *European Culture expressed in Agricultural Landscapes*. Palombi Editori, Roma, pp. 115–148.
- Fischer, T. B. et al. 2012: ESPON EATIA: ESPON and Territorial Impact Assessment. Final Report. ESPON, Luxembourg.
- Go, F., Lemmetyinen, A., Hakala, U. 2015: Harnessing place branding through cultural entrepreneurship. Palgrave Macmillan UK, London.
- Golobič, M., Breskvar Zaucer, L. 2010: Landscape Planning and Vulnerability assessment in the Mediterranean; <http://www.pap-thecoastcentre.org/pdfs/Landscape%20Vulnerability.pdf>
- Golobič, M., Marot, N., Kolarič, Š., Fischer, T. B. 2014: Applying territorial impact assessment in a multi-level policy-making context – the case of Slovenia. *Impact Assessment and Project Appraisal* 33(1): 43–56.
- Gonzalez Bernaldez, E. 1981: *Ecologia y Paisaje*. Blume, Madrid.

- Görg, C. 2007: Landscape governance. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 38(5): 954–966.
- Gunderson, L.H. 2000: Ecological resilience — in theory and application. *Annual Review of Ecology and Systematics* 31: 425–439.
- Hagan, S. 2001: *Taking Shape. A new contract between architecture and nature.* Butterworth Heinenmann, Oxford.
- Hewitt, R., Hernandez-Jimenez, V., Zazo-Moratalla, A., Ocón-Martín, B., Román-Bermejo, L., Encinas-Escribano, M. 2017: Participatory Modelling for Resilient Futures, Action for Managing Our Environment from the Bottom-Up. *Developments in Environmental Modelling (series editor Fath, B. D.), Volume 30.* Elsevier, Amsterdam.
- Hewitt, R., Van Delden, H., Escobar, F. 2014: Participatory land use modelling, pathways to an integrated approach. *Environmental Modelling & Software* 52: 149–165.
- IEA and the Landscape Institute 1995: *Guidelines for landscape and visual impact assessment.* E and FN Spon, London.
- Ingersoll, R. 2003: A postapocalyptic view of ecology and design. *Harvard Design Magazine*, Fall18.
- Jacques, D. L. 1980: Landscape Appraisal: The Case for a Subjective Theory. *Journal of Environmental Management* 10: 107–113.
- Kallipoliti, L. 2010: “No more Schisms”. *EcoRedux. Design Remedies for an Ailing Planet* 80 (6): 14–24.
- Kruse, A. (ed.), Centeri, Cs., Renes, H., Roth, M., Printsman, A., Palang, H., Benito Jorda, L., Velarde, M. D., Kruckenberg, H. 2010: *Glossary on agricultural landscapes.* Hungarian: *Journal of Landscape Ecology (Special Issue)*: 99–127.
- Krovakova, K., Semerádova, S., Mudrochova, M., Skalos, J. 2015: Landscape functions and their change - a review on methodological approaches. *Ecological Engineering* 75: 378–383.
- Landscape Institute, Institute of Environmental Management 2013: *Guidelines for Landscape and Visual Impact Assessment 3rd edition- consultation draft*”. Landscape Institute, London.
- Learmonth, R., Whitehead, R., Boyd, W., Fletcher, S. 2007: *Living and working in rural areas: a handbook for managing land use conflict issues on the NSW North Coast.* Department of Primary Industries, Wollongbar.
- LI and IEMA 2013: *Guidelines on Landscape and Visual Impact Assessment, 3rd Edition,* Landscape Institute and Institute of Environmental Management and Assessment. Routledge, London, New York.
- Marot, N. 2010: Planning capacity of Slovenian: municipalities. *Acta Geographica Slovenica* 50(1): 131–157. (Figure 45)
- Martinez de Pison, E. 2000: *Estudios sobre el paisaje.* Fundacion Duques de Soria – Ediciones Universidad Autonoma de Madrid, Madrid.
- Martinopoulos, G. 2016: *Solar Energy in Buildings.* In: Elias, S. A. (ed.) *Reference Module in Earth Systems and Environmental Sciences,* Elsevier, Amsterdam.
- Mitsch, W. J. 2012: What is ecological engineering? *Ecological Engineering* 45: 5–12.
- Mitsch, W. J., Jørgensen, S.E. 1989: *Ecological Engineering: An Introduction to Ecotechnology.* John Wiley and Sons, Hoboken, New Jersey.
- Nakicenovic, N., Swart, R. 2000: *Emissions Scenarios 2000 - Special report of the Intergovernmental Panel on Climate Change,* Cambridge University Press, Cambridge.
- Nayak, D. R., **Miller, D. R.**, Nolan, A. J., Smith, P., Smith, J. U. 2010: Calculation carbon budgets of wind farm on Scottish petlands. **Mires and Peat** 4: 1–23.
- Olwig, K. R. 1996: Recovering the substantive nature of landscape. *Annals of the association of American geographers* 86(4): 630–653.
- Opdam, P., Coninx, I., Dewulf, A., Steingröver, E., Vos, C., van der Wal, M. 2016: Does information on landscape benefits influence collective action in landscape governance? *Current Opinion in Environmental Sustainability* 18: 107–114. (Figure 37.)
- Palomo, I., Martín-López, B., López-Santiago, C., Montes, C. 2011: Participatory scenario planning for protected areas management under the ecosystem services framework: the Doñana social-ecological system in southwestern Spain. *Ecology and Society* 16(1): 23.
- Pérez-Soba, M., Petit, S., Jones, L., Bertrand, N., Briquel, V., Omodei-Zorini, L., Contini, C., Helming, K., Farrington, J. H. M., T. M., Wascher, D., Kienast, F., de Groot, R. S. 2008: Land use functions - a multifunctionality approach to assess the impact of land use changes on land use sustainability. In: Helming, K., Pérez-Soba, M., Tabbush, P. (eds.): *Sustainability impact assessment of land use changes.* Springer, Berlin Heidelberg, pp. 376-404.
- Puolamäki, L. 2012: Individual views and shared landscape of folklore in Reykholtssdal, Iceland. *European Countryside* 2: 162–178.
- Raskin, P., Monks, F., Ribeiro, T., van Vuuren, D., Zurek, M. 2005: *Global scenarios in historical perspective,* Millennium Ecosystem Assessment. UNEP, New York.
- Ringland, G. 1998: *Scenario Planning.* John Wiley & Sons, Chichester.

- Ryn, S. V. D., Cowan, S. 1996: Ecological design. Island Press, Washington.
- Schroth, O. 2010: From information to participation: interactive landscape visualization as a tool for collaborative planning (Vol. 6). vdf Hochschulverlag AG, Zürich. (Figure 43b)
- Scognamiglio, A. 2012: Chapter 6 – Building-Integrated Photovoltaics (BIPV) for Cost-Effective Energy-Efficient Retrofitting, In: Pacheco-Torgal, F., Granqvist, C., Jelle, B., Vanoli, G., Bianco, N., Kurnitski, J. (eds.) Cost-Effective Energy Efficient Building Retrofitting. Woodhead Publishing, Sawston, Cambridge, pp. 169–197.
- Scognamiglio, A., Bosisio, P., Di Dio, V. 2013: Fotovoltaico negli edifici, Edizione 2013 (Photovoltaics in buildings. Edition 2013). Edizioni Ambiente, Milano.
- Somogyi, V., Sebestyén, V., Nagy, G. 2017: Scientific achievements and regulation of shallow geothermal systems in six European countries – A review. Renewable and Sustainable Energy Reviews 68: 934–952.
- Steinitz, C. 1967: Computers and regional planning: the DELMARVA study. MA: Graduate School of Design, Harvard University, Cambridge.
- Stremke, S. 2017: Energy Transition at the Regional Scale: Building Sustainable Energy Landscapes. In: Ruby, I., Ruby, A. (eds.) Infrastructure: Space, Ruby Press, Berlin, pp. 217–228.
- Stremke, S., Koh, J., 2011: Integration of Ecological and Thermodynamic Concepts in the Design of Sustainable Energy Landscapes. Landscape Journal 30(2): 194–213.
- Thérivel, R. 1997: Strategic environmental assessment in Central Europe. Project Appraisal 12(3): 151–160.
- Vanclay, F. 2003: International principles for social impact assessment. Impact Assessment and Project Appraisal 21(1): 5–12.
- Valles-Planells, M., Galiana, F., Van Eetvelde, V. 2014: A Classification of Landscape Services to Support Local Landscape Planning. Ecology and Society 19(1): 44.
- Volkery, A., Ribeiro, T., Henrichs, T., Hoogveen, Y. 2008: Your vision or my model? Lessons from participatory land use scenario development on a European scale. Systemic Practice and Action Research 21(6): 459–477.
- Yang, H., Cui, P., Fang, Z. 2010: Vertical-borehole ground-coupled heat pumps: A review of models and systems. Applied Energy 87(1): 16–27.

Links

Numbering starts with 5 because the glossary presents in terms of references with the preface one item as a whole.

- http5: <https://www.earthmirrors.com>
- http6: www.snh.gov.uk/docs/B858929.pdf
- http7: www.ccwwdaonb.org.uk/outstanding-landscapes/landscape-character/
- http8: <http://www.snh.gov.uk/docs/B1118160.pdf>
- http9: www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-resource-library/glossary-of-terms/
- http10: <https://www.toposmagazine.com/yanweizhou-park-a-resilient-landscape/#05-yanweizhou-birdeye-view2-631x440>
- http11: <http://landuse.co.uk/sectors/energy-infrastructure/>
- http12: <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/communities/talking-about-our-place/>
- http13: <https://www.ap.org/en-gb>
- http14: <http://newatlas.com/enerken-edmonton-waste-to-biofuels/14393/#gallery>
- http15: <http://biofuel.org.uk/glossary.html>
- http16: <https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels>
- http17: <http://www.alternative-energy-news.info/technology/biofuels/>
- http18: www.gov.uk/guidance/industrial-energy-and-non-food-crops-business-opportunities-for-farmers
- http19: <https://de.pinterest.com/pin/312015080408785184/>, with permission of Enerkem
- http20: [http://enerkem.com/about-us/technology/\[12/06/2017](http://enerkem.com/about-us/technology/[12/06/2017)
- http21: www.biogas-info.co.uk/ (UK Government portal on aerobic digestion)
- http22: <http://european-biogas.eu/biogas/> (European Biogas Association)
- http23: <https://www.nortisgroup.com/services/biomass/>
- http24: www.treehugger.com
- http25: www.ehpa.org (European Heat Pump Association)
- http26: <http://egec.info/> (European Geothermal Energy Council)
- http27: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_geothermal (EU Research and Innovation, Geothermal Energy)
- http28: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_hydro
- http29: www.small-hydro.com/about/small-scale-hydropower.aspx
- http30: www.aquaret.com

http31: <http://www.emec.org.uk/marine-energy/>
 http32: <http://www.oceanenergy-europe.eu/>
 http33: https://ec.europa.eu/research/energy/index.cfm?pg=area&areaname=renewable_solar
 http34: <http://standards.globalspec.com/std/9996054/ds-en-50583-1>
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 http39: <http://www.unescobkk.org/culture/tools-and-resources/tools-for-safeguarding-culture/culturalmapping/>
 http40: <https://saadaqeelazaroonimapping.wordpress.com/2011/04/14/cultural-planning/>
 http41: https://www.creativecity.ca/database/files/library/cultural_planning_toolkit.pdf
 http42: <http://www.parksandgardensuk.wordpress.com>
 http43: <http://www.hoeb.de/index.php/bildergalerie>
 http44: http://www.estuary-guide.net/guide/chapter7_assessing_impacts.asp
 http45: <http://ec.europa.eu/environment/eia/home.htm>
 http46: https://promo.gelifesciences.com/gl/BP/UP_art4.html#.VvvPeuIrKUk
 http47: <https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/aktuelle-fakten-zur-photovoltaik-in-deutschland.pdf>
 http48: <http://commin.org/en/planning-systems/national-planning-systems/latvia/1.-planning-system-in-general/1.5-basic-elements.html>
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 http50: www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation
 http51: <https://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf>
 http52: <https://www.iap2.org/?page=pillars>
 http53: https://cultureelerfgoed.nl/sites/default/files/publications/manual_energy_heritage_and_environment.pdf
 http54: <http://www.lea-ptuj.si/en/services/local-energy-concept/>
 http55: http://sba-int.ch/1274-Strategic_Environmental_Assessment
 http56: <https://www.espon.eu/tools-maps/espon-tia-tool>
 http57: Renderplanet.it
 http58: <http://www.saratogaassociates.com/visual-assessment/visual-assessment/16452900>
 http59: www.macaulay.ac.uk/ccw/task-three/via.html#ref
 http60: <https://www.epa.gov/laws-regulations/summary-national-environmental-policy-act> (US United States)

Sources of illustrations

Here are listed the sources of illustrations which do not come from printed/published sources or html but generally refer to persons, companies or institutions.

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